HYATT'S HAND-BOOK

OF

GRAPE CULTURE;

OR,

WHY, WHERE, WHEN, AND HOW

TO PLANT AND CULTIVATE A

VINEYARD, MANUFACTURE WINES, ETC.

ESPECIALLY ADAPTED TO

THE STATE OF CALIFORNIA.

AS, ALSO, TO THE

UNITED STATES, GENERALLY.

BY

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EDITOR OF "CALIFORNIA RURAL HOME JOURNAL," FORMERLY CONSUL GENERAL OF THE UNITED STATES TO THE EMPIRE OF MOROCCO, AND EIGHT YEARS UNITED STATES CONSUL TO CHINA, ETC.

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TO THE

HONORABLE EZRA CORNELL,

SENATOR OF THE STATE OF NEW YORK,

THE

ENLIGHTENED AND LIBERAL FRIEND AND PATRON

OF

Agricultural and Horticultural Progress and Improvement;

CULMINATING IN HIS LAST GRAND ENTERPRISE,

THE

ESTABLISHING AND ENDOWING OF THAT MOST NOBLE INSTITUTION,

THE CORNELL UNIVERSITY,

AT ITHACA, N. Y.,

THIS LITTLE WORK ON GRAPE CULTURE

IS MOST

RESPECTFULLY AND CORDIALLY DEDICATED

BY HIS

FRIEND AND FORMER FELLOW TOWNSMAN,

THE AUTHOR.

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INTRODUCTION.

Grape Culture in California, although it had its commencement nearly a century ágo, has, until a recent period of time, been of very limited extent, confined principally to the narrow limits occupied as missionary stations, by the Jesuit missionaries from Spain. They selected, generally, the most fertile regions of California, and those supposed to have the most genial, healthful climate. And, as their secondary object, next to that of propagating their religious creed, was to encourage the culture of the soil, and the improvement of agriculture and horticulture around their several missions; and, coming, as they did, from one of the finest grape growing countries of the world, it was very natural that they should have brought with them, not only the taste and experience of the best viniculturists, but also choice specimens of the grapes of Spain, their father-land. Hence, it is presumed, we owe the origin of what is at this day known as the *Mission grape* of California; a very excellent grape it still is, but as the world has advanced, somewhat, during a century of time, it is to be expected that the science of grape culture, and the improvement of the varieties and qualities of the fruit, would have also advanced; and the good fruit of a century ago, has been outrivaled, though

not yet quite superseded, by a better fruit of to-day. As we have intimated, it is only of comparatively recent date, since California came into the possession of the United States and the occupancy of its people, that grape culture has been extended, and greatly improved in this country. But, as in all cases where our American people set out to do anything, they go at it with a *rush*, to use a homely but expressive phrase, and are not always guided by the coolest judgment or most prudent discretion. What is too hastily done, is not apt to be well done. Hence, in rushing wildly into the culture of the vine, a few years since, as soon as it was found that California had a climate and soil unrivaled for such a purpose, they did not stop to think that there might be spots even in this fairy clime, where grape culture would be less successful than in other still more highly favored localities.

As a case in point: We inquired of a friend, who had long been a resident of California, why he did not go into the culture of the grape? He replied that he had done so at an early day, and that the result was an entire failure. We suggested that he must have chosen an unfavorable locality, unfit soil, etc. He admitted that such was the fact; that he commenced in the neighborhood of the Bay of San Francisco, and as a matter of course in such a damp, foggy climate, he could expect nothing but failure. But with more than 10,000,000 of acres of the choicest grape lands in the world, in California, there is *now* no excuse for choosing an unfavorable soil or location for a vineyard in this State.

We have studied and examined this matter somewhat thoroughly; and we are satisfied, and have endeavored to explain to our readers in the following pages, that there is now no reason for

making a mistake in the selection of the proper climate, soil, and location for grape growing.

This brings us to the point of our subject where it may be proper to give the reasons,

Why we were induced to write this Hand-Book of Grape Culture. The Author, having some years since purchased several thousand acres of the choicest vine-growing lands in California, located in the counties of Napa, Solano and Yolo, and selected therefrom one hundred acres for a home-vineyard (which hath been christened "MOUNT GLENWOOD"), and while making preparations to go on with his plantation the coming winter, he wished to profit by the experience of those who had not only studied the subject of grape culture in California thoroughly, but had also had practical experience in the matter, and bring them to aid his own experience and observations, gained by several years' residence in California. In gathering these experiences together, and noting them in book form, for his own convenience, he found he had a mass of useful information that was of the utmost importance to him, and without which he could not well go to work intelligently, or with any fair prospect of success. And hence, the idea suggested itself to him, that what was so essential to his own guidance and success, might also be of equal benefit to others. And some judicious friends, to whom he had suggested his plans, approved of them, and urged him to prepare a work that all might avail themselves of, who wished to engage in grape culture in California, or who take an interest in the subject.

And, therefore, this little HAND-BOOK OF GRAPE CULTURE maketh its appearance.

Nor do we confine our work simply to California. But in its

progress we found it necessary to embrace grape culture in the United States generally, with glances at the systems practiced in Europe.

The author, having spent many years in foreign countries, in climates similar to that of California, is enabled to give the result of his observations and experience in those countries, which may be of practical benefit in California. After several years' residence on the borders of the Mediterranean, with frequent explorations in the south of Spain; and an eight years' residence in China, visiting Java, spending a summer in Japan, visiting the Island of Cuba, South and Central America, etc.; he has come to the conclusion that of all the countries he has become acquainted with, California presents altogether the most favorable prospects for the culture of the grape, as well as all the semi-tropical fruits; and believes it will ere long be distinguished as the "Land of the Vine, the Fig, the Orange, the Olive, and the Palm."

There is, perhaps, no employment more agreeable, or more remunerative, than the culture of the vine. Its origin dates far back into the remote ages of antiquity; and it must have flourished in the garden of Eden; and it seems not to have been a *forbidden fruit*, like the apple.

And to Adam, God said: "Behold I have given you *every herb* bearing seed, which is upon the face of all the earth, and *every tree*, in the which is the fruit of a tree yielding seed; *to you it shall be for meat.*" "And God saw *everything* that he had made, and behold *it was very good.*" Gen. i.: 29, 31.

The first direct account, however, that we have of the culture of the *vine*, is in the Book of Genesis, ix.: 20: "And Noah began

to be an husbandman, and *planted a vineyard*, and drank of the wine"—and—behaved very improperly!

It was not till after the flood, when Father Noah, having been kept so long *on water*, thought of resorting to *wine*, and did so, a little too freely. He does not seem to have been as considerate even as the heathen poet Ovid, who came some centuries after him. Ovid says:

> I own I think of wine the moderate use,
> More suits the sex and sooner finds excuse;
> It warms the blood, adds lustre to the eyes,
> And wine and love have ever been allies;
> But carefully *from all intemperance keep*,
> Nor drink till you see double, lisp or sleep.

And here, this little extract forms an opportune and appropriate text or motto, from which to add a few remarks in reply to the question, "*Does the production and use of wine necessarily tend to induce or encourage intemperance?*" We answer most emphatically and understandingly, No! In all our experience and observation in the wine districts of Europe, and among all classes of Europeans where cheap, pure wines were abundant, and the common beverage of the people, we remarked it then, and have reflected much upon it since, and all these observations and reflections have left upon our mind the full and clear impression and belief, that there was far less intemperance among the people of those vine growing and wine making countries than in our own, where all kinds of foul, poisoned, adulterated stuff, under the name of *whiskey*, *brandy*, *rum*, *gin*, etc., are drunk by our people for the want of a purer, more nourishing, and harmless beverage, like that of the pure juice of the grape, now made by all *honest* viniculturists in

our own country. We do not mean the bogus, doctored, drugged liquids often palmed off upon our people as good foreign and domestic wines; but the pure juice of the grape, such as is now being turned out in great abundance by our vintners in California, and which can be bought at a price that brings it within the reach of almost every one. Corn and wine, in the Bible, are put for all kinds of necessaries for subsistence. See Psalms, generally, In Spain, where pure, cheap wines are drunk almost as commonly as water, we do not recollect to have scarcely ever met with an intoxicated man.

Pure cheap wines are, in our opinion, better temperance missionaries, and will do more to expel from our midst the accursed *fire-water* that has done so much to demoralize and debase its victims in our land, than can all the over zealous crusaders against wine-growing and wine-drinking that are sent forth by our temperance organizations, no doubt from very good, but mistaken motives of philanthropy.

And he who speaks thus, feels he has a right thus to speak. For he can say (and does it in no spirit of boasting) what probably few of the modern apostles of temperance can themselves say, that after a life of over half a century, spent chiefly in large towns and cities, in the midst of temptations whose name was legion upon legion, he knows not to this day, from personal experience, what the sensation of being *intoxicated* is like. And further, he can show, from the records of the times, that nearly *forty years ago*, while yet in his teens, he wrote the first address to the young men of America, urging them to organize a Young Men's Temperance Society, aided in organizing such an institution, *the First Young Men's Temperance Society formed in the United States;* was its

President, made before it his "maiden speech," an elaborately prepared Temperance Address, which was published in the papers of that day. And he still feels an earnest desire to see intemperance banished from the land; and believes that one of the most efficient means of doing it, is to encourage the growth and use of pure, cheap wines, the unadulterated juice of the grape.

It is contended by some, that the taste for wine produces a taste for other and stronger kinds of ardent spirits. We do not believe it; it is against our own observation and experience. It might as well be said the babe should not imbibe the milk from its mother's breasts; for fear it would give it a hankering after *milk-punch!* For there is quite as much similarity or affinity between these two beverages, as between the pure juice of the grape, that cheers, enlivens, strengthens, and makes healthful its recipients, and the vile, drugged, poisoned liquors which make their victims mad, drunk, and their "steps to take hold on hell."

No, the good things of this world are made to be used, not to be abused. If wine making had been a very bad business, or a wicked, we do not believe the Saviour would have engaged in it, or have been endowed with miraculous power from on high to produce it, even for a bridal occasion.

In China, the Chinese make and drink little or no wine; yet they are made drunk on opium, furnished and forced upon them by the Christianized, temperance preaching nations of the Occident; and on *samshu* or *sanshau*, a fiery spirit, a sort of gin, distilled from rice; *ergo*, according to the logic of modern temperance zealots, the growing of rice is wicked, and ought to be tabooed and abandoned, although it is the "daily bread" of one half of the human race—of over 600,000,000 of people. The Lascars of India, the

Malays of the Indian Archipelago, where no wine is made of any account, rush immediately into the use of the strongest alcoholic drinks, without waiting to tamper or make an appetite, by the use of such weak stuff as common wines, whenever they come in contact with the seamen of our Christian nations, or can get access to the *fiery fluid* of our Christian society. And so with the Japanese and the Tartars. In Africa, the Moors, being Mohammedans, are not allowed to make or drink either wines or strong drinks; yet if an occasional derelict Moor can get access to the *aguadiente* of the poor Hebrew, he for the time being, forgets that "Allah is great, and Mohammed is his Prophet."

But, in our own country, it is by no means necessary that all who cultivate the vine should go into the business of wine making. Let every man who can, cultivate a vineyard. Those who have conscientious scruples against wine making, can raise grapes for the table, for making raisins, or for drying; or for supplying "*Grape Cure*" establishments, such as are being introduced into Germany, with success, (for a more full account of one of these, see part XVI,); there is certainly no harm in that.

But to resume our history of the vine.

Canaan is spoken of as a land of wheat and barley and vines; and the grapes of Eshcol brought from the land of Canaan between two spies, on a staff, is a story familiar to all. Under the name of Eshcol, Foster in his Hebrew Dictionary says:

I knew a Nurnburg monk of the name of Acacius, who had resided eight years in Palestine, and had also preached at Hebron, where he had seen bunches of grapes which were as much as two men could conveniently carry. Another authority, Christopher Neitzschutz, who traveled through Palestine in the year 1634,

speaking of his excursions on the Jewish mountains, says: I can say with truth that I saw and ate of bunches of grapes which were each half an ell, and the grapes two joints of a finger in length.

And the Syrian grapes, which we have now in California, grow to a very large size; and when our vines shall reach the age of those in Palestine, we may make a similar exhibit as to size with those of its Oriental homeland. A bunch of the Syrian grapes, weighing 19 lbs., is said to have been raised in England. Herodotus, Strabo, Homer and other writers of antiquity, speak of the vine and of wine making in the most remote periods of the world's history. Said Pharaoh's chief butler, Gen. xl.: 9: "In my dream, behold, a vine was before me, and in the vine were three branches; and it was as though it budded, and her blossoms shot forth; and the clusters thereof brought forth ripe grapes. And Pharaoh's cup was in my hand, and I took the grapes and pressed them into Pharaoh's cup, and I gave the cup into Pharaoh's hand."

This was certainly an original and primitive way of wine making. Many very large grape vines are spoken of in both modern and ancient history. The columns of Juno's temple, Metapont, as well as a statue of Jupiter, for the city of Apollonium, were made of the wood of the vine; and the great doors of the Cathedral of Ravenna are made of vine planks, some of which are twelve feet long and fifteen inches broad. In California we have one of the largest vines of modern times, measuring in the circumference of its trunk three feet. A more detailed description of this vine will be found under the head of California Varieties of the Grape.

But we must not prolong our Inroduction, lest we weary the

reader before coming to the more important subjects of this little Treatise.

The haste with which it has been prepared, allowing us only about a month's time to gather together and arrange our materials and write out its pages (which have greatly exceeded in number what we originally intended), must be our excuse for any errors or deficiencies that may be found to occur; we wished, and our publishers desired to have it ready for the press as speedily as possible, so that it might meet the demands of those who wish to begin the business of vine growing in California, or at the East, or to improve their vineyards already commenced, the current season.

Our aim has been to make our little book a complete *Hand-book of Grape Culture for California*, and the *United States*, as well; especially adapting it to our own State. Many, very many, works have been written at the East, on the subject of grape growing generally; but not one of them is at all adapted to California. The only work on grape culture in California that we are aware of, is that of Col. Haraszthy, written in 1862. This is an interesting and useful work, containing 400 large pages, partly devoted to the subject of growing the sugar cane, sugar beets, silk worms, etc

The large size, and consequently more expensive price of that book, together with the new discoveries and improvements that have been made in grape culture, since it was issued, four or five years since, seem to call for just such a cheap little Hand-book for the people generally, as that which we now present. We have endeavored to embody in it everything that is necessary for the vintager to know on the subject, who is now engaged, or intends hereafter to engage, in the culture of the vine and wine

making, marketing grapes, or the making of raisins. We use the term *vintager*, although nearly all our contemporary authors use the term *vintner*, when they speak of the vine dresser or grape culturist. Our standard lexicographers define *vintner* to mean "one who deals in wine; a wine seller." *Vintager*, "one that gathers the vintage." Hence, we deem the term *vintager* to be more appropriate than that of *vintner* in speaking of the cultivator of the vine, and as being synonomous with *viniculturist;* and have so used it in the following pages of this work. When we speak of a *vintner* we mean one who sells wine, merely.

With these somewhat desultory, rambling, introductory remarks, we submit our little *Hand-Book of Grape Culture* to the public for their examination and approval, if it shall be found worthy of it.

T. H. H

San Francisco, Cal., *January* 1, 1867.

PART I.

INDUCEMENTS TO ENGAGE IN THE CULTURE OF THE GRAPE.

Grape-growing and wine-making to be the leading interests of the rural population of California; profits of the business; viniculture progress and prospects in California; 40,000,000 of vines and 2,000,000 gallons of wine the estimated products of California for 1865; number of acres and vines in France; Wilson Flint's description of the vintage or grape harvests in California; and of the early superiority of the Putah Valley region for grape-growing; the dry weather and favorable vintage season; no rot; the abundance of grape sugar and grape alcohol in California wines accounted for; the *quantity* of California wines to the acre greatly beyond that of foreign countries; the *quality* may be equal or superior; estimated amount of grapes sold in the San Francisco market; capital, energy, enterprise, all that are required to place California at the head of grape-growing and wine-making countries; Haraszthy's statement of what is necessary to insure success in grape culture in California; the Reese River Reveille's opinion of viniculture in California; wine-making a leading source of wealth in California; Stockton Independent's view on the subject; no failure of the grape crop in California in eighty years; opinion of the United States' Commission of Agriculture; reports of the same, expressing the opinion that California is destined to be the "great wine country of the world;" the author advises to cultivate the vine *somewhere.*

THE inducements to engage in the culture of the grape in California may be briefly summed up thus:

First. California has the best soil and climate in the

United States, if not in the world, for the growth of the grape.

Second. The grape crop *never fails* in this State, either in drought or in wet seasons; or has not for a period of eighty years.

Third. The grape requires no *irrigation* in California.

Fourth. It is the most *sure, profitable, pleasant, and healthful* rural employment that can be engaged in.

Fifth. Grapes of the best varieties can be produced in this climate and soil from two to three months earlier than in any of the Eastern States, and also all foreign varieties that none of those States can produce at all in the open air; consequently, when the Pacific Railroad shall be finished (in three to four or five years, probably), we can supply New York and other Eastern cities at large and remunerative prices, without competition.

Sixth. Such grapes as are not required for table use can be made into *wine* that improves and will grow better with age; the improved quality and enhanced value will far more than doubly compensate for the interest on the value of the stock kept over.

Seventh. There is no danger of *overstocking the wine market;* the demand will exceed the supply for a century to come.

Eighth. Grape vines do not, like most kinds of fruit trees, deteriorate by age, but grow better and more fruitful the older they become.

Ninth. They do not, when properly planted, suffer from mildew or other disease, nor from noxious insects, in California.

Tenth. We can produce *raisins*, as well as wine, and all the choice varieties of foreign grapes, of the best quality

Eleventh. The best lands for grape culture in the world can be had in California, at from $10 to $100 per acre, while the grape lands in Ohio, and other Eastern wine-growing sections, are selling for from $500 to $1,000 per acre; and planted vineyards in Europe as high as $10,000 and upward per acre.

We shall endeavor in the following pages to demonstrate all these facts, and many more, in relation to vine-growing in this country.

Grape-growing and wine-making are soon to be *the* great business enterprises of the rural population of California, presenting, as they already do, greater inducements to the enterprising husbandman than almost any other branch of husbandry.

It will be seen, by the method recommended in subsequent pages of this work, that an expenditure of only about $1,400 per year, on the average, for six or seven years, will give to the vintager, at the end of that period, a closely planted vineyard of one hundred acres, or 272,200 vines, which would be worth at least $100,000. According to the estimate of the products at the end of the seventh year, as made by Col. Haraszthy, the vineyard would yield a profit of 25 per cent. per annum, or $1,000 per acre, or $100,000 for the entire vineyard. And as the vineyard, instead of depreciating, is only growing more valuable as it increases in age, what business can pay better, or is more sure of success, than this?

VINICULTURAL PROGRESS IN CALIFORNIA.

At the commencement of the past year the author had occasion to prepare a statement of facts and estimates,

showing the progress of grape-growing and vinicultural operations generally for the preceding year, from which the following statements appear: The production of wine for the year was estimated to be 2,000,000 of gallons, and the number of vines at 40,000,000.

If we take these 40,000,000 vines as the present number in California, when they shall all come to the age of say three to five years, it may be fairly calculated that they will produce 40,000,000 gallons of wine each year. Probably within three years from this time, this amount will be produced. A great advantage in the culture of vines is, that the older they grow the more they will yield. And if the prospects of the vine shall be as favorable for the next five years as they are at present, we do not think it extravagant to estimate the number of vines in California, at that date, at 100,000,000. This may seem extravagant; but, at the rate of increase for the past few years in California, we shall soon overtake France and the best wine-growing countries in Europe. In France they have 6,250,000 acres in vineyards, which, at 600 to the acre, would be 3,750,000,000 of vines. And what is there to prevent California reaching the products of France, before the close of the present century? Can Ohio, or all the States East, equal this exhibit in California?

Speaking of the grape-harvests in California, the difference of climate, &c., Wilson Flint, of Sacramento, in an able paper in the Report of the Department of Agriculture, published in Washington, in 1863, says: "This joyous festive season comes in July and continues until December, it being earlier or later according to the locality where the particular vineyard may happen to be situated. At Woolfskills, on Putah Creek, in Yolo County, the Mission grape ripens in July; while in Sonoma, not more than

seventy miles distant, but near the cool sea atmosphere, the same variety does not ripen until October. One of the most favorable features in wine-growing in California is to be found in the dry weather, which continues entirely through the ripening season. This has the effect of ripening the grapes uniformly. When a bunch of grapes seems to be ripe, every grape on that particular bunch will be found equally ripe. So favorable is the autumn to the grape, that no signs of rot are ever discovered, and the earlier ripening bunches will often be found hanging on the vines, perfectly cured raisins. This favorableness of season gives to the grape an abundance of grape-sugar, which, in the process of fermentation, becomes grape-alcohol, and thus accounts for the strength of California wines, making them equal to the strongest European, and not requiring any addition of alcohol distilled from grain or cane sugar, as do most European wines, as well as the wines of the Atlantic States."

As to *quantity*, experiments have shown that the soil and climate of California will produce more than double the yield per acre of any European wine-producing country. France and German wine countries are said to produce 175 gallons to the acre, and Italy, under the best circumstances, about 400; while California will produce 1,000. And we have in California 20,000,000 acres of land, more or less suitable to the growth of the vine—covering a territory extending the whole length of the State, about 600 miles north and south, about 100 miles in breadth, lying just back of the coast range of mountains that skirt the Pacific shores of our State from the borders of Mexico to Oregon. In this broad range of country, also, the climate is not excelled by that of any country of Europe, not excepting balmy Spain or sunny Italy. This is the testi-

mony of those who have resided in those countries as well as this, and we can confirm it from our own personal experience; and it is generally conceded, by the best viniculturists, who have had experience in vine-growing in the old world and in California, that we have grapes and can produce them to any extent, that will make as good *quality* of wines as any of the varieties raised in Europe. All it requires is to select the best varieties, keep the wines *pure*, and until they have age enough to give them the requisite body and flavor. The grape crop has never been known to fail in California, nor to suffer, to any extent, from the mildew, or the ordinary diseases to which it is subjected in other countries, and especially in the Eastern States of our country, where the vine has been damaged severely during the past season, particularly in Ohio, Indiana, New York, &c. In addition to the superior vinous quality of our grapes, we can produce as fine table grapes and as luscious raisins as France, Spain, Germany, or Italy. We suppose that not less than $200,000 worth of table grapes have been sold during the past year in San Francisco market alone, at a price ranging from 5 to 75 cents per lb., or, at 10 cents per lb., a fair average, we believe it would make 1,000 tons, or 2,000,000 lbs.

What, then, is wanted, with all these flattering prospects before us, to make California one of the richest and most prosperous vinicultural countries in the world? The answer may be summed up in three words: *Capital—Energy—Enterprise.*

But we must consider the culture of the vine, says Col. Haraszthy, not only as carried on by wealthy companies and rich private individuals, but also by men with small means who wish to embark in this so well paying branch of industry. What a chance for such individuals! What

a difference between them and the grain or stock farmer! A man engaged on a grain farm needs at least 160 acres to make a living. To fence this in California it requires cash for material, as lumber, posts, and nails, in a favorable situation, outside fence and division fence, at least $1,000, besides his labor; one pair of horses, harness, wagon, harrows, plow, hoes, spades, grain and hay for his horses, seed for his land, provisions for eight months, another thousand and five hundred dollars, or in all $2,500. In any other country but California, a man who possesses $2,500 considers himself well off. In this sum, however, no price for land is included, this he gets from the Government, if he finds any left. Now, how is it with the man who has no such sum as we have stated? what is he to do? and what can he do? He can plant a vineyard with very little capital; what does he need?

First of all a pick, a crowbar, a shovel, a spade, an ax and wheelbarrow, and one year's provisions. He goes to work, rolls the rocks out of his way into a fence, inclosing ten acres therewith, or with chapperal and brush, as either of the two are good for fencing wine lands, and he will usually have plenty of them to make his fence. This done, he hires some neighboring farmer to plough up for him this land, and exchanges work for him in harvest time; or, if no such chance exists, he goes to work, digs his holes, plants his vines; when finished planting, then he hoes the space between the vines with fork-hoes. It is hard work; but industrious men, anxious to get an independent home, will do hard work. The planting and cultivating his newly-planted vines will not take him more than half the year; the balance of the time he can work out, and earn enough to supply him with provisions for next year. He annually increases his plantation; in the third year he

has a small income, enough to buy his provisions, and in course of six years, this man will be independent, with an income of a couple of thousand dollars, and worth in property from ten to fifteen thousand dollars. This is the difference between the farmer and the vintager: one can begin with nearly nothing, the other needs, at least, $2,500; these are not imaginary things, but facts.

Viniculture in California.—Says the *Reese River Reveille:* Col. Haraszthy has written a very interesting letter to the farmers' paper, the RURAL HOME JOURNAL, relating to viniculture in California. From reading Col. Haraszthy's communication, we would almost be induced to believe that vine-growing was a better business than silver mining. It is very pleasant to advocate the interests of a country like California, where buds sprout, fruit blooms, and birds sing in the winter time; but quiet pleasures are not always perfect pleasures; and the case of California life does not satisfy as well as the strifes and occasional great success in the mines.

Says the Stockton Independent: It is really a matter of astonishment that a field of wealth, so expansive and inviting for the production of the grape as California embraces, has remained so long, in a measure, unoccupied. There is every thing to encourage and nothing to deter the vine-grower. View the subject as he may, correct reasoning will bring him to no other conclusion than that it is an occupation which cannot fail to reward ordinary industry and intelligence in a very liberal manner. The labor is light, healthy, and cheerful, and the reward a matter of certainty. Thousands of men, industriously inclined, but who are physically unable to follow the hardest kinds of manual labor, could find profitable employment in the vineyard. The success of the pursuit is no longer an ex-

periment, but one from which an annual revenue, exceeding that of the gold mines, will unquestionably be forthcoming, if the attention is paid to the subject which its great importance justly claims. No farmer who possibly can plant grape vines on a large scale should neglect to do so, and do it too at as early a day as possible, for he will find that, in the end, nothing he can do with his land will prove more remunerative, or more satisfactorily requite him for his labor.

Wine-making a Leading Source of Wealth.—Already it is a well authenticated fact that, in all the elements necessary to make it the vineyard of the world, says the same authority, there is no country which surpasses California. In virtue of climate, quality of soil, and extent of territory, where is the country under the sun which annually yields a vintage more uniformly excellent and sure, and likewise requiring so little care and attention? The crop never fails, nor is the fruit ever diseased. The shores of the Mediterranean do not equal the slopes of the Pacific, and the chalky hillsides of Andalusia do not excel the gravelly hills of the mining counties of California in the production of grapes, from which wines of unsurpassed richness and sweetness can be manufactured. The Riessling wines of the Rhine, or the famous product of the country near Naples, will yet be eclipsed on our own golden hills. Burgundy, Hock, Medoc, St. Julian, Frontignac, Madeira, Muscat, Margaux, Malaga and every variety of wine produced in France, Germany, Spain, Italy, or anywhere else, can be equaled, if not surpassed, in our own land of sunny skies and equable climate, if the proper exertions are put forth and efforts made to do so. Grapes of every known variety flourish and yield abundantly in California, and it only needs more attention

directed and energy applied to the development of a source of wealth unequaled even by what is esteemed the great fountain of riches—the mines. The different modes of propagating, training, and pruning the vine, are secondary in importance to the necessity of planting and enlarging the area of vineyards, so that wine in abundance may be exported from the Pacific shores, and the people be profited by the enriching element, which nature has so lavishly bequeathed to them. Already there are nearly fifty millions of grape vines in the State, and there should be a thousand millions, more or less. It is estimated, we believe, that a grape vine ten years old, is good for a gallon of wine, and certainly a gallon of *good* wine is good for a dollar. Suppose, then, that one thousand million vines—only twenty times the number now growing—were planted this year, the revenue derived from the yield, in the course of ten years, would be immense.

Already has the wine business become an important feature in the interest of the State, and is destined to become a leading pursuit of the people. While grain-raising and other agricultural pursuits are, to some extent, precarious, the annual crop of grapes may be expected and counted upon as a certainty—something which will never fail to repay the labor and means expended, and even were it not so profitable as many other occupations, its certainty alone is a sufficient incentive to induce thousands to embark in the business.

Certainty of the Grape Crop in California.—Mr. Wilson Flint states that at some of the Missions records have been made of the character of each year's vintage, through a period of upward of eighty years; and there is not an instance mentioned where the grape crop was a total, or even partial failure, or produced wine of an infe-

rior quality. This is more than can be said for the best wine countries in Europe, where, during the past sixty years, there have been but eleven good wine crops.

In the monthly report of the Department of Agriculture, for September, 1865, is a letter to the department, from W. S. Powell, of Tulare County, California, in which he says: I do not think you have any just conception of the adaptability of this country for the production of wine. Practical experience enables me to say that 1,000 gallons of pure wine is but a fair yield from an acre of vines six years old; and what may seem to you more incredible, Mr. James Persian, our largest cultivator of the grape, and most experienced vintner, assured me, but a few days ago, that he candidly believed, in a favorable season, he could select an acre in his vineyard that would yield 2,000 gallons of wine. So peculiarly favorable is the climate, that the most tender European varieties are perfectly hardy here. The Chasselas de Fontainebleau, White Chasselas, and Black Prince are now ripe.

And this was the 8th August.

The Commissioner of Agriculture, in introducing this letter to his readers, adds: We have heretofore frequently referred to its (California's) favorable climate for grape production, but it is even better than we had supposed.

From an article which we find in the report of the Statistician of the United States Agricultural Department, for 1864, we make the following extract from an article on vine culture in California:—The assurance which the act of Congress has given, by its increased duties on foreign wines, that the home market will be at the command of the home production, is infusing a greatly increased vigor into vine planting in California. The fact, too, that it is a crop that will seldom be much injured by the occasional extreme

droughts of the California climate, and that its habitual dryness during the summer is highly advantageous, will also give an additional stimulant to grape cultivation. With these motives to the full development of the great natural advantages that California has as a wine-producing country, we may anticipate such an advance as *will make it the great wine country of the world;* and as this advance progresses, to draw such attention as will increase correspondingly the demand for its wines.

And *we* agree with the above writer fully.

But to those who are unable or indisposed to come to California, to engage in grape culture, we would say: *Cultivate the vine somewhere*, and in a small way, if not situated so as to go largely into the business. Nothing pays better, or is more attractive in country life.

PART II.

CLIMATE BEST ADAPTED TO THE GROWTH OF THE VINE.

Importance of a Suitable Climate; the Rain Gauge of Vine-Growing Countries; Climatology of the same; Compared with California—shown by Thermometrical Tables; Suitableness of the Climate of California for the Growth of the Grape; Various authorities on the subject; the several Latitudinal Limits in the Eastern States within which certain named Varieties of the Native Grapes will succeed; none suited to the culture of; the European grape in the open air; California adapted to all.

The influence of *climate*, in its altitudes, degrees of heat, and rains, on grape growing, has not, as justly remarked by an intelligent writer, received that systematic consideration which is due to its importance. The Western States have at times in the summer months a moist, sweltry atmosphere, during which the *grape rot* is most fatal. The general elevation of these States is from 500 to 700 feet above the sea level. Whether a greater elevation, from 1,000 to 2,000 feet above it, would not be free from the rot, is a question not determined. In a dry climate like that of *California*, the altitude is immaterial, for the dryness is sufficient in the lowest localites to shield the grape from rot. If these localities have a rich and moist soil, then the vines are liable to be unhealthy.

The report of the Department of Agriculture for 1862 has several tables of the quantities of rain which fall

during the year in California, as compared with the Eastern States and some of the vine-growing regions of Europe. These tables, with additions of our own, follow this, and will be found most interesting for reference and comparison.

	Annual Rain Gauge.	Inches of Rain.				
	1856-'62.	Spring.	Summer.	Autumn.	Winter.	Total.
Pacific Coast....	San Francisco, Cal.....	4.6	.7	3.7	8.8	17.8
	Sacramento.....	3.3	.1	3.2	6.9	13.5
	" average 5 yrs., '53-58.	..	..	..	..	15.4
	Los Angelos.....	2.5	.1	1.6	5.5	9.7
	State of California, 1856.....	4.2	.1	1.0	7.4	12.7
Eastern States..	Cincinnati, O.....	11.9	14.2	10.0	11.3	47.4
	Cleveland, O.....	9.1	11.6	9.8	6.9	37.4
	State of Ohio.....	6.5	8.0	7.0	7.0	28.5
	State of New York.....	7.5	11.0	8.0	15.0	41.5
	Ann Arbor, Mich..	7.3	11.2	7.0	3.1	28.6
	Pittsburg, Penn.....	9.5	12.3	7.6	7.4	36.8
	St. Louis, Mo.	12.7	14.6	8.7	7.0	43.0
	State of Missouri.....	10.0	10.4	9.7	9.0	39.1
	Nashville, Tenn.....	14.1	14.0	12.3	12.4	52.8
Europe.....	Turin, Italy.....	8.2	9.0	11.5	7.8	36.5
	Valley of the Rhone.....	10.2	9.5	10.4	4.3	34.4
	Vevay, Switzerland.....	7.9	10.8	11.1	3.9	33.7
	Manheim, on the Rhine.....	6.3	8.0	7.4	5.3	27 0
	Bordeaux, West France.....	7.3	7.4	10.3	9.0	34.0
	Dijon, East France	7.1	7.5	9.3	7 3	31.2
	Chalons, Northeast France.....	5.4	6.2	6.1	5.6	23.3
	St. Michaels, Azores.....	6.6	3.6	9.5	11.7	31.4
	Malaga, Spain.....	4.5	.2	5.8	12.8	23.3
	Madeira.....	..	..	..	..	21.7
	Lisbon, Portugal.....	..	..	..	..	27.1

The climate producing the least rain or moisture during the summer and autumn, when the grape is ripening and being gathered, is the best climate for the grape. It will be seen by the foregoing table that the rain gauge of California is nearer like that of Malaga, the best grape region in the world, perhaps, than any other country. California has, in spring, 4.2 inches, Malaga 4.5 inches. In summer

California has $\frac{1}{10}$ of an inch, Malaga $\frac{2}{10}$ inches. In autumn California has 1 inch, Malaga 5.8 inches, showing that the autumn, the vintage season, in California is better even than that of Malaga. New York, Ohio and Missouri, the other States compared, are far behind. California has also, it will be seen, less rain by half than any of the principal grape-growing regions of Europe, not excepting France, Italy or Spain, Madeira or Portugal.

Mr. Strong, of Boston, in his recent excellent work on Grape Culture says: That the rain has great fertilizing power is beyond question. With the vine it promotes excessive vegetation, and, also, by an excess of humidity at times, with sudden and extreme change to heat and dryness, causes rot and mildew. The growth of the vine is far greater with us (says the same writer) than at Los Angelos, where the grape is so stubbed that it supports itself without a stake, and there is no necessity of summer checking. Yet the salubrity of the Pacific air, and the uniformity of climate, make it a favored spot both for European and American grapes.

Range Thermometrical.

1856.	Sacramento.	Malaga.	Extremes at Malaga.	
			Maximum.	Minimum.
Jan	50°.44	58°.6	64°	56°
Feb	57°.39	57°.0	65°	53°
Mar	61°.25	60°.9	67°	57°
Apr	67°.09	64°.5	68°	58°
May	72°.10	67°.6	77°	66°
June	78°.64	76°.6	81°	92°
July	79°.57	79°.9	84°	78°
Aug	80°.55	79°.9	85°	78°
Sept	78°.95	76°.9	80°	74°
Oct	66°.98	71°.6	78°	64°
Nov	60°.46	64°.9	68°	50°
Dec	42°.58	59°.1	63°	55°
Mean	66°.91	68°.1		

MISCELLANEOUS OBSERVATIONS.

	Mean, Year.	Mean, Summer Months.	Mean, Autumn Months.	Mean, for July and Aug.
California.....	62°			
New York.. ..	45°			
Ohio.....	48°			
Missouri.....	40°			
Lisbon.....	61°.4	70°	62°	72°
Madeira.....	65°.5	70°	67°	72°
Bordeaux	57°.0	71°	57°.	73°
Cadiz.....	62°			
Naples	60°.3	74°	61°.4	76°
Marseilles.. ...	58°.3	..	..	76°

Sacramento, Cal.—Highest range, June, 100°; Lowest, Dec., 25°.

By the thermometrical tables on the preceding page, which we have made up from various sources, believed to be the most authentic, it appears, taking Sacramento as a criterion or average for California, that the mean average temperature of the year was 67°; at Malaga 68°; and that the three summer months at Sacramento averaged 79°, and at Malaga 78°; Madeira and Lisbon each 70°. The three autumn months, or vintage season, in Sacramento, indicated 68°; at Malaga, 71°; Lisbon, 62°; Madeira, 67°.

From this, as well as from the foregoing table showing the rain gauge of California, as compared with the finest grape growing regions of Europe, it will appear that there is no more favorable climate for the culture and growth of the grape, than California.

Other authorities, in abundance, might be cited to establish this fact, were it necessary. We will allude only to a few of these:

Frederick Muench, of Missouri, in his excellent little work, "School for American Grape Culture," says:

California is, perhaps, of all the United States, best adapted to the growth of the grape.

James S. Lippincott, of New Jersey, in an essay in the

Agricultural Report of the Department of Agriculture of 1862, on the subject of the proper climate for the grape, says:

The degree of moisture or dryness is of essential value in judging of the productiveness of different years and different places. A summer mean, or rather the mean for the season of growth, is generally, a certain measure of fitness, and the mean temperature of 65° is defined the lowest that will permit the vine to ripen.

Boussingaults, in his "Rural Economy," says: The lowest summer temperature permitting the vine to succeed in Europe, is 65°, and a summer below 67° will not produce wine of any valuable quality or quantity.

None of these objections apply to California.

The Agricultural Report of 1862 says: All European varieties of the grape grow well in this State (California), as also those of the Atlantic States. This fact is significant of the remarkable adaptation of its climate and soil to the culture of the grape, and indicates that California will become the *greatest wine country of the world.* Mr. Hittell, in summing up its superiority, says:

California vineyards produce, ordinarily, twice as much as the vineyards of any other grape district, if report be true. The grape crop *never fails*, as it does often in every other country.

A commission on the investigation of the affairs, progress, prospects, etc., of the Buena Vista Vinicultural Society of Sonoma, consisting of the well known citizens of San Francisco, W. C. Rawlston, G. H. Howard, G. W. Beaver, Fred. Law Olmstead, and H. W. Carpentier, in their report, say:

The advantages which California possesses for the production of wine over any European country, is chiefly

found in its climate, which is probably the best in the world for the purpose. Through extensive districts of the State, during all the period of the year in which the grape is growing and ripening, the sky is nearly cloudless and the air warm and dry; hail is unknown; nor in sixty years, during which time authentic and particular accounts are extant of the vineyards planted by the Spanish missionaries, have any of the diseases to which the vine is subject in Europe appeared here. The advantage of the climate, however, is greatest at the period of the vintage. An entirely satisfactory vintage season, that is to say, one in which damp weather or frosts do not occur to the manifest injury of the grapes, and consequently of the wine, is expected in European vineyards not oftener than once in ten years, and when it occurs is an occasion for special national thanksgiving. In California, whatever variations have been experienced in the climate at other seasons, a perfect vintage season has never failed. The consequence is that grapes ripen uniformly, and rot is unknown. This greatly facilitates and cheapens the labor of gathering the grapes, and simplifies their subsequent treatment and the whole process of wine-making.

Col. Haraszthy says: The California climate, with the exception of the sea-coast, especially where the prevailing western winds drive the fogs over the locality, is eminently adapted for the culture of grape vines, and it is proved conclusively, that no European locality can equal, within two hundred per cent., its productiveness.

Mr. Lippincott, in his Essay on the Geography of Plants, in the Report of the Department of Agriculture for 1863, thus describes the varieties of climate required by the several varieties of grapes mentioned; as well as the grape

limits in Europe, which we think, in the main, will be found to be correct:

The limits to the culture of the vine in Europe, are generally fixed where the mean annual temperature is from 50° to 52° Fahrenheit (at Sacramento it is 67°). Under a colder climate in Europe no potable wine is produced. To this meteorological *datum* must be added the fact that the mean heat of the cycle of vegetation of the vine must be at least 59° Fahrenheit, and that of the summer from 65° to 66° (in Sacramento it is 79°). Any country which has not these climatic conditions cannot have other than indifferent vineyards, even when its mean annual temperature exceeds that above indicated. It is impossible, for instance, to cultivate the vine upon the temperate table lands of South America, where they nevertheless enjoy a mean of from 62°.6 to 66°.2, because these climates are characterized by constancy of temperature, never rising to the higher heats necessary to the process of sugar forming, and the vine grows and flourishes, but the grapes never become thoroughly ripe. A *summer heat, prolonged into autumn, is of more value than high summer heats*, with a lower temperature later in the season. (In Sacramento it is 60° to 79°.) The mean temperature of summer is not a safe criterion for judging of the adaptation of a district to vine culture. A mild autumn must be regarded as one of the essential conditions, and, consequently, the mean for the entire period of growth where the higher heat is nearer the termination of that cycle, becomes a better evidence of fitness of any region for producing wine of the highest quality.

These requisites, as set forth by Mr. L., it will have been seen, by the table of thermometrical range on a preceding page of this work, are eminently prominent in California,

and equal to those of the finest grape growing regions of the Mediterranean.

Mr. L. lays down the following rules as a guide to those who may wish to know what varieties of our native grape are best adapted to their several regions of country:

1. Those places which have a summer temperature of 65°.5, a hot month of 70°, and a September of 60°, will ripen the Delaware, Clinton, Perkins, Logan, King and some other very hardy varieties. The temperature of their growing season corresponds to a mean of 65° and upwards, and an aggregate of heat of about 8,000° Fahrenheit. This district includes many parts of New England and New York, Northern Pennsylvania, Northern Michigan, Wisconsin and Iowa.

2. Those places which a summer of 70°, a hot month of 72°, and a September of 63°, will ripen the Concord, Hartford, Prolific, Diana, Crevelling, &c. Their season of growth corresponds to a mean of 67°, and an aggregate of 8,500° and upwards. This district covers part of the southeast and south coast of New England, Valleys of the Hudson and Mohawk, neighborhood of the minor lakes of Western New York, southern borders of Lake Ontario, Southern Michigan, Southern Wisconsin, &c.

3. Those places which have a summer of 72°, a hot month of 73°, and a September of 65°, will ripen the Isabella. Their growing season corresponds to a mean of 70°, and an aggregate of 10,000° of heat. They are not found in the State of New York, except in the southeast extremity, lower Valley of the Hudson, and near some of the minor lakes, but appear on the southern border of Lake Erie, in Northern Indiana and Northern Illinois.

4. Those places which enjoy a summer mean of 73°, a hot month of 75°, and a September of 65°, will ripen the

Catawba. Their growing season corresponds to a mean of 72°, and an aggregate of 11,000°. They are not found north of New York city and vicinity, or the southeastern counties of Pennsylvania, Middle New Jersey, or Southern Ohio, Indiana, Illinois and Missouri.

5. Those places which bask under a glowing summer of 74°, a hot month of 75°, and a September of 75°, as at Los Angelos, in California, other circumstances being favorable, may ripen the most tender European wine grapes to perfection.

This will apply to nearly all sections of California, the foregoing writer might have added.

PART III.

BEST SOILS FOR A VINEYARD.

Diversity of views on the subject; opinions of Downing Barry and the Author; the Author's experiences in Viniculture in the "Land of the Moor," and Observations in Malaga; Professor Emmons' Analysis of the wild grape vine; a simple mode of analyzing soils; Thomas George Shaw's description of the soils of the grape region of Madeira; Report of the Ohio and Lake Shore Grape Growers' Association on the subject of soils; Discussion of the Fruit Growers' Association of Western New York on the same subject; Hittell and Col. Haraszthy's opinions, as also the views of a variety of vinicultural authorities.

This is a subject on which there has been no little diversity of opinion, in by-gone days. Experience, however, seems to have brought recent vine-growers nearer to a point of agreement on the subject. It used to be thought necessary to have a *rich* soil, well manured. Barry, an experienced fruit-grower, says: In all stages of its growth, it (the grape) should have a dry, rich soil—dryness first and most of all. Even Downing, who was so thoroughly versed in all pertaining to fruit culture, sums up his opinion by saying: The essence of all that can be said in grape culture respecting soil is, that it be dry and light, deep and rich.

This used to be *our* opinion; and, acting upon it, while cultivating an old vineyard in the neighborhood of the

Mediterranean, on the Morocco coast, which we had purchased of a Moor, we had it thoroughly manured with a fine, rich mould, taken from an old slaughter ground. Our Moorish vinedressers shook their heads in dubious misgivings at our innovation, but we fancied our superior intelligence and book-knowledge more than a match for their long experience and old fogy notions. But the result proved that our modernized theories were not so far ahead of their nomad experiences as we had anticipated. It is true, our vines grew more thriftily, bore larger fruit, but evidently not so delicate and sweet as the previous crops had been.

And many of the vineyards near the Straits of Gibraltar were in soils made almost entirely of drift sands from the beach or surrounding sand hills; and yet they had thriven and flourished, and produced their annual fruits for ages. So, in Malaga, and the Vega of Grenada, we found most of the vineyards on barren-looking hills and sterile mountain sides; and we doubt if the grapes of Morocco, and of Malaga and Andalusia are excelled by any other portion of the globe, *except California!* The climate and soil of California approach nearer to those countries than any that we have ever met with in our somewhat extensive travels. And when we shall have had the experience in testing the various kinds of grapes, and proving their adaptability to our soil, or rather when we shall have discovered for the best kinds and choicest qualities their nearest affinity of climate and soil in California, we shall be able to compete successfully with the best vine-growing regions of the Mediterranean, or of Europe, in the production of the choicest grapes for the table, for wine-making, or for raisins.

Those who may have at hand the facilities for analyzing

their soils, may wish to have before them an analysis showing the constituent parts of which the grape vine is composed, to enable them to adapt their most appropriate soils to its culture.

The following is an analysis of the wild grape vine, made by Professor Emmons:

	Wood.	Bark.
Potash	20.84	1.77
Soda	2.06	0.27
Chloride	0.02	0.40
Sulphuric acid	0.23	trace.
Phosphate of lime	15.40	5.04
Phosphate of peroxide of iron	1.20	5.04
Carbonic acid	34.83	32.22
Lime	16.33	39.32
Magnesia	4.40	0.80
Silex	2 80	14.00
Soluble silica	0.00	0.30
Coal and organic matter	2.10	1.70
	100.21	100.86

There is a still simpler mode of testing the adaptability of soil to the culture of the wine grape that is within the reach of all, and which is said to be practised by the agricultural schools of Germany. It is thus:

Take a quantity, say about five pounds, of the soil you intend to select for your vineyard; put such a soil in a clean vessel; pour boiling water over it; stir it well with a clean piece of wood or spoon; let it stay covered for two days; then carefully pour off the clean water; taste the water, and if you find no salty or moldy taste in it, the soil is fit for a vineyard; because what would give a bad taste to the water would do the same to wine made from grapes grown in such soil.

E. W. Bull, an enlightened viniculturist of Massachusetts, and originator of the Concord grape, in one of his essays on the culture of the vine, published in the Massachusetts Ploughman, says the soil best suited to the grape is a warm and dry soil, such a soil as is best suited to the growth of Indian corn.

Grape Soil in Madeira.—Thomas George Shaw, author of Wine, the Vine, and the Cellar, published in London in 1864, states that the earth of the choice vineyards of Madeira is composed of soft rock (*pedra molla*), which never becomes a fine mould, but is generally in a crumbly state, like small coal. In this the vines are planted, and there they flourish best, as, from the loose nature of the earth, the moisture gets more readily to the roots of the vines, and the sun's rays penetrate with more immediate effect.

We have, no doubt, soils among the foot-hills of California similar to those of Madeira, if not superior, and that will yet be found to produce a wine equal to the so long celebrated wines of Madeira.

Charles Reemelin, of Ohio, in his Vinedressers' Manual, speaking of the proper soil for a vineyard, says: There should always be some sand, some clay, some limestone, and some gravel in it.

The Report of the Ohio and Lake Shore Grape Growers' Association for 1865–6 speaks thus on the subject of Soil for a Vineyard: Contrary to the idea entertained at the commencement of grape culture in this country, it is now the opinion of a majority of *vignerons* that a dry soil produces the best wine, especially with the Catawba grape. Stiff clay is preferred. [This may do for Ohio; but we have far better soils than clayey ones in California.] The soil should be dry; hence underdraining is often a

necessity. Sandy soils may produce as fair clusters, but the quality of the wine is inferior. Gravelly soil is probably next best. Clay crests that crop out of gravelly or sandy districts are excellent. *Manuring is also discarded.* Most experienced growers now consider *manure an injury* when wine is the object of production. The vine will bear abundantly a long time, and remain healthy on a soil too poor for common farming. Manuring may spoil a vineyard. We remember a notable instance of the truth of this in the vineyard which produces the far-famed *Johannisberger*, situated on the Rhine. A proprietor once had it heavily dunged, and the quality was perceptibly injured for many years following, though the yield was increased. The wine makers state that the must of grapes grown on the upland clay soils is richer than that from the flatter lands of the Lake Islands, or from sandy soils.

At a meeting of the Fruit Growers' Association of Western New York, held at Rochester, in June, 1866, the subject of a "Proper Soil for Grapes" coming up, the following discussion was had:

Is a rich soil necessary for the production of good grapes?

Mr. Brown Smith said that a rich soil was not necessary for the production of grapes; thought some of his vines had made such an enormous growth that the fruit was poorly ripened.

C. Downing said rich soil would make a large grape, ripens later, but not so good to eat.

H. H. Farley said a moderately rich soil would ripen better than a richer one.

E. Moody found clay soil produced earlier and better grapes than lighter soil.

C. L. Hoag said, on the rich parts of his vineyard they

were a week later than on the poorer parts; except the Delaware.

W. Griffith said rich soil was a damage to vines; rich soils and moisture were the worst things for vines. Had planted, twenty years ago, a vineyard on corn land, which would yield 30 or 40 bushels to the acre, and had raised crops every year from the third year, except one year: last year had three tons of Catáwbas to the acre; would much prefer dry, hard, forbidding soil, "white bean soil," to richer land.

R. Buchanan, in a work on Grape Culture, published a few years since, in Cincinnati, says: The soil best suited for a vineyard is a dry calcareous loam, with porous subsoil, not retentive of moisture; if mixed with some gravel or small stones so much the better. Some prefer a sandy soil, with a gravelly substratum, as in this the grapes are less subject to rot; the juice, however, is not so rich, lacking in saccharine matter, and in dry seasons the vines will suffer from drouth, shedding their leaves prematurely, and preventing the grapes from ripening well. Any soil underlaid by a stiff wet clay is to be avoided, as also wet or spongy lands.

Muench says the principal component part of the soil should be a loose yellow or brown loam, the white and blue are to be avoided, and if this be mixed with disintegrated granite or lava, limestone, sand, some magnesia, together with a moderate supply of humus (dark ground produced by putrefaction), and if, besides, the subsoil is susceptible of drainage, that is to say, not made impenetrable by stiff clay or solid stone quarries, nor naturally wet, nothing remains to be desired. The presence of pebbles, round, pointed, or of slate form, or of larger stones, make the cultivation more difficult, but improve the

growth of the grape. Broken rocks in the underground, into the clefts of which the roots can penetrate, are preferable to stiff clay.

On California Soils.

We have thus far quoted authorities of a general character, chiefly outside of California, as, although in many respects, California has peculiarities not elsewhere to be found, yet there are certain characteristics, certain general principles that apply equally to all countries, and whose examples and experiences may be of great value to vine-growers in California. We will now give some statements and facts more particularly applicable to California, from some of the most intelligent and reliable authorities of the State.

The commission that examined the operations of the Buena Vista Vinicultural Society, to which we have before alluded in these pages, state that California possesses a large extent of volcanic soils in which alone the best wine grapes of Europe can be cultivated with entire confidence. In the Eastern States all the vines of the Buena Vista Vineyard would be subject to mildew. Here it has never made its appearance.

The Stockton Independent speaks thus: A late correspondent of the San José Mercury, presented an indubitable truth when he said that one of the great drawbacks to the wine interest in Santa Clara county (and the same reasoning is forcibly applicable to San Joaquin and other counties), is that nearly all the wines made are made from grapes grown upon moist and adobe lands. Such soil can never produce good wine. Grapes grown upon such soil

are lacking in saccharine matter, which forms the foundation of good wine. I claim that there is as good soil in this county for the production of good wine as there is in this State or the United States. Take, for instance, that belt of timbered land stretching around the west and south sides of the valley, from Mountain View to Gilroy; there we find a soil of red clay mixed with gravel and limestone, the very best of soil for producing the finest wines, as all who understand the business will attest.

The above shows that vine-growers are directing their attention to high lands for the purpose of planting vineyards, and leave the heavy soil of the valleys, as it should be left, to the production of cereals and other crops. The heavy adobe soil of San Joaquin Valley, particularly on the fields a few miles in extent immediately surrounding Stockton, will undoubtedly produce excellent grapes for table use; but to the higher lands, bordering on the foot hills, to the foot hills themselves, and also to the many suitable locations to be found in the mining counties, must we look for the grapes from which to manufacture a quality of wine that will supplant the imported article. Except in a few instances, the owners of vineyards in the mining counties have given but little attention to wine making; but as soon as they find that the quality which it is in their power to produce will take precedence over valley products, they will be likely to devote more of their time and attention to the business.

The Sacramento Bee thus: We are informed respecting the depredations of the army worms, that they have confined their ravages entirely to the low black lands, known as "adobe," lying all through the great basin of the Sacramento and San Joaquin rivers, but never have been seen or heard of in the foot hills on that reddish gravelly soil so

peculiar to the rolling lands at the base of the Sierras. Consequently, the owners of vineyards in the latter localities will have full crops, while those whose vines are in the black lands of the valleys will be on short rations this season. For ten years we have been urging the abandonment of the black lands to the cultivation of cereals and vegetables, and the transfer of viniculture to the red gravel lands of the foot hills. The wine made from grapes grown on these lands is more rich, fruity and better for all purposes than that grown in the valleys, as it will satisfy the most skeptical who will try those wines made in the vicinity of Coloma, Sonora, Mokelumme Hill and Oroville. If you would grow grapes for table use, irrigation of the vines is necessary up to maturity; if you would make wine, your vines should receive no moisture but the natural rains and dews. Red land for vineyards can be found in any county in the State that borders either upon the Sierra Nevadas or the coast range of mountains. Sonoma and Napa can produce as good wine as El Dorado or Butte if the grape growers of those counties will abandon the valley land and take to the rocky foot hills. A Frenchman who had worked all his life in the celebrated vineyards about Rheims, told us, in reply to a question as to what was the best land for grapes, "land that will grow nothing else," adding that the best vintages he had ever seen were from grapes that were grown on land so rocky that it was necessary to transport soil thither in which to plant the vines.

The Foot Hills.—The Folsom Telegraph says: The soil of the foot hills is proving itself far superior to that of the southern portions of the State, for the successful and profitable cultivation of the vine.

The vine, says Mr. Hittell, likes a sandy or gravelly

(not very moist) soil, and never thrives in wet, loamy, or stiff clay soil. Rich land does not seem to be adapted to the vine in California. He adds: The soil of the vineyards at Los Angelos and Anaheim is a deep, light, warm sand. To the inexperienced eye it looks as though it were too poor to produce any valuable vegetable growth. In Sonoma and Napa valleys, the vineyards are planted in a red, gravelly clay, near the foot of the mountains, or in a light sandy loam, in the centre of the valley. Of late, the vine-growers of these valleys have done without irrigation. In Santa Clara Valley most of the vines have been placed in a rich, black loam, but their vineyards are unhealthy. The Sacramento vines are planted in sandy loam; those of the Sierra Navada in sandy loam or gravelly clay.

Dr. Stentzel, in his Prize Essay, published in the Transactions of the California State Agricultural Society for 1863, thus describes the soil best suited to the grape:

The component parts of the soil must be favorable to the retention of sufficient moisture for the nourishment of the vine, and yet permit of perfect drainage. It is not enough that the *surface* attests its fertility by a luxurious growth of indigenous plants. The *sub-soil* should be sufficiently porous to prevent water stagnating during the rainy season. Hence, heavy clay soils are inadmissible. The product of such soils is a superluxuriant growth of wood, but the fruit is scanty, irregular in size, late in maturing, and of insipid flavor, lacking all the elements necessary for a good wine. A mellow loam, easily worked, and of sufficient tenacity to retain moisture for the thrifty growth of the vine, without irrigation, will give all the essential elements requisite for a vineyard. A red, loamy soil, if of sufficient depth, and produced from the disinte-

gration of adjoining rock formations, is next best; but if the rock near the surface is of a hard sand stone, the growth of vines and fruit will be scanty. A third class, and very extensive one in some parts of our large valleys, consists of gravelly, loamy soils, which will rate according to their fertility and permeability.

In many respects (adds Dr. S.), California is highly favored by nature for a wine country. A net-work of mountains affords the necessary shelter from the prevailing winds, and the high grounds are free from the nightly condensed vapors of the low valleys, while the dry season extends indefinitely the length of time necessary for the perfect development and ripening of the grape. Few countries can boast of the favorable climatic conditions which permit the already palatable fruit to remain upon the vine three months longer, subject to the laboratory of solar rays, converting it into delicious rasins or ambrosial juice.

We will bring our evidences and statements of the soils best adapted to the growth of the grape to a close, with the remarks of Col. Haraszthy on the subject, and some comments of our own:

When the planter resolves to plant a vineyard, says Col. H., he should determine whether he is planting to produce grapes for wine or for the market. If for the former, he must look for a soil which is made by volcanic eruptions, containing red clay and soft rocks, which will decay by exposure to the air. The more magnesia, lime or chalk the soil contains, so much the better. This kind of soil never cracks, and keeps the moisture during the summer admirably. Such soil will produce a wine that will keep good for fifty or one hundred years, and improve annually; is not liable to get sour, or when exposed to the air, after one

year old, to get turbid and change color in the bottle or glass.

Col. H. also recommends a shell-mound soil, gravelly clay, slightly mixed with sand; also a light, sandy, gravelly soil. All these he considers valuable, in the order in which we have noted them, as *wine* soils. For marketable *table grapes*, he recommends a rich, black, gravelly or sandy loam, exceedingly mellow; and recommends manuring with well-rotted sheep manure.

We have dwelt somewhat at length on this part of our subject, and quoted the opinions and experiences of a variety of wine-growers, both from abroad and at home, as we deem the subject of selecting a suitable soil for the culture of the grape, one of vital importance to the success of the viniculturist; the absence of a proper attention to which has led to many of the failures and discouragements which have attended the efforts of too many of those who have partially attempted the culture of the grape in California. Because California has so many thousands and tens of thousands of acres of choice vine-growing lands, it does not follow that *all* of the lands in our State are equally suited to that purpose; nor that one kind of grape can be made to succeed on a soil exclusively adapted to a grape of an entirely different character, and requiring a diametrically opposite quality of soil. The pioneers in extensive vine-growing in California may be excused for the errors and failures incident to the undertaking of introducing, acclimating, and naturalizing the numerous varieties of foreign grapes that have been introduced into our State during the past ten or fifteen years. But *now* the genial adaptability of our climate, and the capability and affinities of our soil to the successful growth and production of the choicest and most delicate kinds and varieties of the foreign

grape ought to be so well understood, at this day, as to render any mistake or failure inexcusable. The *climate* and *soil*, nature has furnished; these you ought now to be able to choose understandingly.

PART IV.

LOCATION, SITE AND EXPOSURE FOR A VINEYARD.

The best Position, Site and Exposure; Diversity of views; some prefer the valley, some the hills, others hill-sides; some a southern, some an eastern, some a western, some a northern exposure; all partly right and partly wrong; all exposures good, under certain circumstances and for certain purposes. The Author's choice at Mount Glenwood; nature the safest teacher, cloudless skies of California; the grape everywhere free from mildew; five geographical and isothermal divisions in California, each peculiarly adapted to a peculiar character of grape. Best sites and exposures for vineyards in the Eastern States; various authorities; vineyards on the hill-sides of Oporto and Malaga.

The best locations, position, etc., for a vineyard, have been incidentally touched upon, in discussing the subject of soils. It has been shown that the soil usually found on hill-sides, or gently rolling hills, is better adapted to the growth of the wine grape, than that of the low lands. But we deem the subject of a proper site or position and exposure, of scarcely less importance than that of soil; and consider it well deserving of an especial chapter, setting forth the various experiences and opinions of those best qualified to judge, as well as our own views on the subject.

Although many of the early vine growers of this country commenced their vineyards upon the bottom-lands of our valleys, even in some instances in *adobe* or rich alluvial soils, yet subsequent observation and experience have

established the fact that hill-sides and rolling hills, such as are usually found along the region of the foot-hills, or even upon somewhat rugged mountain sides, as well as upon scattering or rolling hills sometimes found in the midst of our valleys, are best adapted to the production of grapes possessing the rich, saccharine qualities necessary to make good, palatable and marketable wines.

It is very properly said, by Dr. Strentzel, in his Prize Essay, to which we have before alluded, that the location and aspect of a vineyard, and the component parts of the soil, exercise a paramount influence on the quality of the grape; hence we find the product varying in countries, districts, adjoining vineyards, and even on a small plat of land; hence, also, the proper selection of the location of a vineyard, is of the utmost importance. The peculiarities of our climate, adds our essayist, admit of greater latitude in selection, and crown with moderate success the use of soils which, in countries otherwise blessed with copious and frequently recurring showers, would be inadmissible. For this reason, an aspect otherwise considered unfavorable does not entirely shut off success, but if we wish to attain a high degree of excellence, this does not absolve us from the necessity, especially if the product of the vineyard be destined for wine, to select a location sloping gently to the *south east*, with an open aspect to the south and west. Such a location will secure a full exposure to, and yet mitigate the scorching rays of the noonday sun. Besides, the aspect due south is less favorable here, as the soil on the southern slopes is in most cases less fertile.

On the subject of *exposure* there is not a little diversity of opinion among authorities in California. The writer just quoted prefers the south east; others, the west, or north, as less liable to be injured in case of frosts. Mr.

Wm. Daniels, another California Prize Essayist, says the aspect should be *southwest;* that is, the ground should slope in that direction; but adds, any slope, either southwest, west or northwest, is better than a slope in the opposite direction. Never choose an eastern aspect if you can possibly avoid it. A great portion of California is subject to late frosts, long after the vine has just put forth its young, tender shoots. The coldest part of the night is just before sun rise, and the frosts in California, will on an average, be twice as severe on an eastern slope as they are on a western. The western slope will receive the warm sunshine all the after part of the day, and long before it receives the parting rays of the setting sun, the eastern slope will be left in the shade; and if the ground is well cultivated it will imbibe warmth from the sun as long as it shines. This will often preserve it from frost when the eastern slope is quite white. The first bright rays of the morning sun, striking the tender frosted foliage on the eastern slope, will scorch it like an oven; whereas, on the western slope, supposing a light frost has dropped down, the atmosphere above the vines will become warm before the sun strikes the foliage, creating a warm, incipient fog, often sufficient to draw out a light frost before the bright rays of the sun strike directly on the foliage, so that the frost has left no sign.

Now these two approved essayists, both appearing to be men of sense and experience, take somewhat opposite positions on this subject. And, in our opinion, both are *right* and both *wrong*, to a certain extent; that is, the one is right in saying that a *southeast* exposure (under some circumstances) is best; and the other, in giving the preference to a *southwest* aspect; and both wrong, in implying that their own particular choice of aspect or exposure is

invariably the best, and exclusively to be preferred. As there are, doubtless, in California, as well as in other States, certain altitudes and cold, damp exposures where an eastern or southeastern aspect might be preferable, and necessary to secure the genial warmth of the sun, so essential to the early and perfect maturity of the grape, and to avoid the *oïdium*, mildew, etc.; while in portions of the country where there is no rain and little or no moisture, during long, hot summers, and where the earth parches and bakes with the scorching rays of the ever burning sun, not only a southwest, but even a north, northeast or northwest exposure may be admissible, if not preferable.

On this subject the intelligent planter and vintager must use his own judgment and good sense.

The Author's Choice at Mount Glenwood, Yolo county.

We have selected for our own vineyard at Mount Glenwood, grounds that slope east and west, north and south, southeast, southwest, northeast, and northwest, as well as the summit of moderately elevated hills, or table lands; and this in a location on the western borders of the Sacramento valley, on the first bench or plateau of hills rising from the plains toward the foot hills that lie at the base of the eastern slope of the last coast range of mountains; in the neighborhood of Putah Cañon, and near to Putah Creek; and we hope, ere long, to be able to demonstrate from actual experience, what kind of an exposure is best in locations of that description.

One thing we have noticed, in running the eye along the serrated tops and sides of that last of the inland coast range of mountains, and that is, that the northerly sides of the hills and mountains during the dry weather of summer exhibit a much greener appearance in vegetation, a far more thrifty display of verdure, than those facing the south or east.

Hence, we infer that a northerly exposure, in that particular locality, will be best. Nature is the safest teacher; her laws are unerring; follow them and science and practical experience will do the rest.

We will, however, give a few more authorities on the subject, as we wish all shades of opinion to be fairly represented, so that the reader can judge for himself.

Mr. Charles Delton, in his Prize Essay, says: A southerly aspect is the most suitable for a vineyard.

Col. Haraszthy, the veteran vine-grower of Sonoma, is of opinion that in California locality is not so material as in European countries, especially those where, during the summer season a good deal of rain falls. If the vineyard is not exposed during the whole day to the sun, the rain will rot and damage the grapes. California, he adds, having an even temperature, is warm, and, without rains in summer, almost any locality will do; but, if a western gentle slope can be obtained, by all means it should be taken.

Wilson Flint, also an experienced, practical viniculturist of California, in an able article written for the Department of Agriculture, at Washington, and published in its volume of Reports for 1863, has some very clear, practical views on this subject, from which we condense some important facts.

Most writers on vine culture (says Mr. Flint) recommend planting vineyards on a southern and eastern aspect. Such situations are very favorable in seasons exempt from heated terms; but when these occur it will be found that a vineyard having a northwestern slope will suffer less from sun scald, and ripen its superior fruit at an earlier day. Northwestern slopes always have a more equal isothermal condition than those facing the midday sun. The

true source of injury to the leaf of the vine from extreme heat arises mainly from the refraction upon its under surface of the sun's rays from the earth; hence, where the seasons are sufficiently long it would seem to be desirable to plant the vine on the northwestern slopes. Vineyards on such situations will be less liable to injury by late spring frosts.

The season throughout California, from May until November, is that of cloudless skies, under which the grape will grow everywhere exempt from mildew and rot, except on low, moist bottom-lands or near the shore of the ocean, on that part of the coast north of Santa Barbara. The prevailing winds in the summer from the colder latitudes of Behring's Strait become charged with a great deal of humidity as they seek admission upon the land through the gaps in the coast range of mountains in the vicinity of San Francisco. Rising from the sea in immense thick mists, sometimes with the copiousness of showers of rain, these banks of fog are cold and chilly, but become dissipated upon the dry atmosphere before spreading far into the interior, though within a range of twenty miles from San Francisco they have a very deleterious effect on the leaf of the vine and the young grape. Within the sweep of these cold winds and fogs few European vines escape the mildew, and even the American grape is cultivated with unsatisfactory results. Beyond a radius of twenty miles from San Francisco an entirely different climate is found, where the vine meets a congenial atmosphere. Excluding these localities near the coast, where cold sea-breezes and fogs prevail, it may be safely stated that all other portions of the State, lying under an altitude of three thousand feet above the seaboard, are suited to vine culture. In the entire State there are some

one hundred and fifty-five millions acres of land, one-third of which, in hisopinion, is well adapted to the production of wine.

GEOGRAPHICAL AND ISOTHERMAL DIVISIONS OF THE GRAPE-GROWING REGIONS OF CALIFORNIA.

Mr. Flint makes four general distinct districts in California with isothermal and meteorological conditions as widely differing in their characteristics as there are to be found varieties of soil. He divides them thus:

First. All that portion south of Monterey county, with the exception of the volcanic range of hills near San Gabriel. This district has long been celebrated for the abundance of its crops of large and luscious dessert grapes, and, until a recent period, it furnished nearly the entire supply of wine for home consumption as well as export. The vineyards in this district are mostly planted on a sandy loam, and receive copious artificial irrigation in the bearing season. To this cause, with the soft, moist atmosphere which prevails in the evenings and mornings, may be ascribed the large size of its grapes, and the abundance of grape sugar which they contain, when allowed to remain on the vines until fully ripe. For the above reasons this district of country is peculiarly adapted to the production of heavy, strong wines and the distillation of brandy.

Second. All the counties lying west of the San Joaquin Valley and south of Yolo. This district being somewhat within the influence of the cool ocean breezes, its grapes will contain less sugar; hence, it is in this section of the State that we must look for light wines, and those particu-

larly adapted to the manufacture of champagne; as the wines are naturally sparkling and somewhat effervescent without any sophistication. The light hock and champagne of the Sonoma Valley have already obtained a high reputation on the Pacific coast, and will compare favorably with the best European wines of a similar character.

Third. The great plains and rolling slopes in the Tulare, San Joaquin and Sacramento valleys. This locality includes much land similar to that in the first named, but with a warmer, dryer climate, as in this district there are seldom any dews, which so greatly assist the formation of the unusually large grapes of the country about Los Angelos. This great interior valley locality will produce a rich sherry and sauterne, as well as a wine similar to the catalana, or port, of the Upper Douro of Portugal.

Fourth. The foot-hills of the Sierra Nevada mountains, as well as the eastern slopes of the coast range west of the Sacramento valley, and the districts already named, lying north and east of San Gabriel, in Los Angelos county. This mountain district will doubtless produce the most valuable wines of any of the localities before named, both on account of climate, which is peculiarly different by reason of its elevation above the sea level and unevenness of surface, as well as on account of the favorable ingredients of the soil.

Mr. F. goes on to add: In all the valley or plain districts the soil is more or less composed of argillaceous marine debris, mixed with sand, gravel and alkali, washed down into what were then inland seas and lakes, from eruptive volcanoes. Below an altitude of two hundred feet above the sea-level, there are the most abundant evidences to show that all the great valleys in the State were covered by water at no very remote period; but above

this mark the soil contains scarcely any evidence by which an opinion can be maintained that it was ever under the dominion of the sea; and the vines grown on these lands will be of a more delicate flavor, and possess a more abundant bouquet. In these mountainous districts are extensive tracts of chalky soil, where scarcely a shrub will grow. The vine, however, is made to flourish here with a little artificial irrigation; and if we may judge the future by the present, the time is at hand when the celebrated wines of the Johannisberg may find a worthy rival in the Sierra Nevada. The seasons being long and dry, with the same liability to heated terms as in the Atlantic States, I consider it (a locality having a *northwestern* slope) preferable in California to a site facing the south and east.

We have thus far, under this head, confined our citation of authorities to California. But as our little volume is expected to find its way to the Eastern States, and is intended to be truly a Hand-Book or Manual for all who may engage in the culture of the vine, we will, as we have done under previous headings of this work, give the opinions of Eastern authors or writers on the subject of the best position, exposure, etc., for a vineyard, as demonstrated by the observation and experience of those who have been most successful viniculturists in those states east of the Rocky Mountains.

Mr. Muench, of Missouri, says: On the northern half of this continent the vine can be raised with profit from 25° to 45° of latitude, so that only a small part of the United States is excluded. The further south the vine-dresser lives, the higher should be the land in which he plants his vines. In the north the lower lands, sheltered by heights, and, consequently, warmer, should be selected, and the sunniest exposures. The rough winds of unprotected situations

should be avoided, while a free, moderate circulation of air is an indispensable requisite. In damp valleys, on flat, marshy low-lands, on exposed mountain tops, or on the shady sides of heights, the vine will not thrive. In the vicinity of the ocean, or of large lakes or rivers, the air seems to possess a peculiarly mild quality, which the vine particularly needs, and, accordingly, we find it in greatest perfection on dry, even rocky and somewhat precipitous, ground, not far from large bodies of water. The distance of a few miles makes a difference in this respect. The vicinity of streams, flowing from mountains over undulating plains is especially adapted to vine culture. . . . In all localities, where we are to economize summer heat, the best position is on a tolerably steep southern slope, somewhat sandy, with dark, rather stony and gravelly, than loamy soil. . . . . Next to the southern position, the southeastern appears to be the best, after which rank the eastern and the directly western. Further it is not safe to venture, unless with species of very early maturity. Thus much for our Missouri authority.

An Eastern paper says: Select your ground on some southern or southwestern slope, *or any other dry land* that you may have. This certainly allows a very generous latitude.

Mr. Charles Remelin, an Ohio writer and author, says: The altitude of a vineyard should neither be too high nor too low as compared with the surrounding country. The exposure should be selected with due reference to giving full chance to the sun's rays during the entire day; and the soil should neither be too rich nor too poor, affording to the roots of the vine and to atmospheric influences an easy chance to penetrate.

Mr. Lippincott's Essay, in the Report of the Department

of Agriculture for 1862, says: On the continent of Europe, vineyards that produce the best wine, are invariably found on dry soils, more or less abounding in lime, and the most celebrated are on the dry, sunny sides of granite or calcareous hills, with the surface terraced, each terrace sustained by a stone wall against which the vines at its base are trained.

Mr. Buchanan, a Cincinnati author, says: A hill-side with a southern aspect is preferred; although an eastern or western exposure is nearly as good. Some have recommended the north, on account of safety from late spring frosts; but it will scarcely afford sun enough to ripen the grapes, in cold, wet seasons (if the declivity is steep), and may, perhaps, be more subject to rot; any undulating surface, if dry, is preferable to a level one.

This will do, for our Eastern authorities for the present.

Describing the vineyards in and about Oporto in Portugal, where the celebrated Port wines are made, Thomas George Shaw, the English author to whom we have before referred, says: When the demand for this sort of wine became greater than its produce, especially in a scanty vintage, it put some English supercargoes, who resided there and at Viana, near Oporto, at that time, on teaching the Portuguese to cultivate the vineyards on the *heights* or *mountains* bordering on the River Douro, from whence the district takes the name *Lima de Douro.*

Speaking of the vineyards at Malaga, the same author says: The very circumstance of the grapes grown here being so excellent, is a proof that if the making of wine were found as profitable as the sale of grapes, very fine wine would be produced. I do not mean because the grapes are so large and fine; for it is a fact, that large, fine eating grapes invariably produce inferior wine; but it is

because the soil, the heat, and the aspect of the various *hills* are so admirably adapted for wine, that the result might be looked upon as certain.

Frederick Bossert, of New Jersey, in an essay on wine, in the Report of the Department of Agriculture, for 1863, after stating that in Germany and France the southern and southeastern hill-sides are considered as best adapted for vineyards, goes on to remark: The more gradual increase of temperature in spring, and the proportionately short summer season, with generally warm, and but few hot days, render it necessary that the vineyards should receive sufficient warmth through the direct rays of the sun, in order to mature the grapes. But it is quite different in this country. The warm temperature sometimes setting in for some consecutive days, as early as January and February, frequently causes the grape vines on the southern sides of the hills, where the effect of the sun is most powerful, to vegetate at this early season only to be checked in its growth by later frosts. Thus they freeze and become sickly, and the crop of the year is either destroyed or reduced. On the north or northwest side of the hills, where the ground is less warmed by the rays of the sun, and where the soil remains longer cold in consequence of the action of cold winds, snows, etc., a few warm days in winter will not be able to force the plants, which, therefore, remain inactive until the approach of the regular warm season, when there is no longer any danger of their growth being injured by frosts. There is no danger from the retarded development either to the fruit or to the plant, as the hot summer and the long-continuing fall will always bring the fruit to maturity; but there is danger from every disturbance after the growth has been started.

PART V.

PREPARING THE GROUND.

Trenching expensive and unnecessary; the Author's views; ploughing deep and sub-soiling and harrowing sufficient; no manuring necessary; grounds can be as well prepared with the plough, subsoiler, etc., for $10 or $12 per acre, as for $200 to $300 by the old mode of trenching; modes recommended by Col. Haraszthy, Mr. Bull, Mr. Griffiths, Mr. Detten and others, for preparing the ground; enclosing the vineyard with a hedge; the Osage Orange recommended; mode of planting such a hedge.

Having in the foregoing pages described the climate, soil, position, exposure, etc., best adapted to the vine, we now proceed to examine and describe the best modes of preparing the ground for planting the vineyard. And here, again, we find a diversity of modes suggested, each one having its advocates, who endeavor to maintain the superiority of their several plans.

Trenching, to the depth of from two to three or four feet, has long been practiced in the vine-growing countries of Europe, where labor is cheap and land dear. Many European vine-dressers, bringing from their fatherland to this country the customs, prejudices, and habits they had followed there, introduced this same expensive practice of trenching their ground for a vineyard. But the more intelligent of those emigrants, as well as our own viniculturists, are abandoning that laborious and expensive mode

of preparing their lands, and resorting to the use of the plough, sub-soilers, etc.

Col. Haraszthy proposes the following mode, which we think a very judicious one: The best mode (says Col. H.) to plough the land is with the so-called deep-tiller, for with it, by putting three horses abreast, you can plough twelve inches deep, except the soil should be very rocky. Follow this plough in the same furrow with a common shovel plough, or, as it is called in some places, bull-tongue. This simple instrument, with two horses attached to it, will tear up and pulverize the earth ten or twelve inches more in depth. There are various designs of sub-soil ploughs, but most of them require a great moving power, and will not answer, after all. The above-named bull-tongue is successfully used by many planters in Sonoma and Napa valleys, but it matters very little what ploughs or sub-soilers the planter uses, so long as he ploughs and sub-soils his land from twenty to twenty-four inches.

Trenching the ground, says E. W. Bull, a successful vine-grower of Massachusetts, is wholly unnecessary. The roots thrive best in the warm surface soil; the fruit ripens more easily, and is of better quality.

No manuring necessary.—Mr. B. says: I have vines that give me annual crops of twelve pounds each, which have had no manure for ten years.

Mr. Griffiths, at the meeting of Fruit Growers of Western New York, at Rochester, the past season, said: I have grown full crops of grapes for fourteen years, without manure, and expect to get good crops for twenty years more; in the same way.

This part of our subject, however, has been treated more at length under our head of *Soils.*

The Rural American says: Trenching for vineyards is

entirely useless, besides being a great expense. The soil can be prepared sufficiently with a plough, at an expense of $5 to $10 per acre, while trenching costs $200 to $300 per acre. German vine-growers have introduced the trenching system into this country, because it is done in France and Germany, where men work for fifteen to twenty cents a day, and where it is more expensive to keep teams of horses and oxen than in this country.

Our way of ploughing for a vineyard, is to employ two teams, one to follow the other in the same furrow, and both plough as deep as a pair of horses or yoke of oxen can draw the plough. If ploughing once does not prepare the land to suit, cross-plough in the same manner, and you will have your land prepared as well for $10 or $12 per acre as it would be if trenched at an expense of $250 per acre.

A writer in the San José Mercury says: First, plough your ground at least one foot in depth; then after harrowing and rolling smooth, plant in lots ten rods wide by forty rods long, seven or eight feet apart (I would prefer eight feet), leaving always between lots roads or avenues sixteen or twenty feet wide. In planting cuttings (which I prefer to rooted vines), cut them long enough to reach one foot into the ground, leaving one or two buds always above ground, always being very careful to press the dirt closely around the vine, and especially at the bottom, as any vacuum there would cause the vine to mould and die. The only attention necessary the first year, will be merely to keep the weeds down, the same as in a cornfield. With this simple mode of planting and culture, I will warrant your vines to thrive as well and bear as early as those planted according to the tedious and expensive modes that you read of in many essays upon the vine.

On the subject of the proper *distance apart* at which vines should be planted, there is much diversity of opinion, many disagreeing with the suggestion of eight feet, as proposed by the writer just quoted, and others. But on this subject we shall treat more at length in another place.

Another writer advises thus: Select your ground on some southern and southeastern slope, or any other dry land that you may have. Plough it from 15 to 20 inches deep, with a plough so constructed as to run in the same furrow, then lay the kind of grape you wish to cultivate 4×4 or 4×10 feet apart, according to the variety. If dwarfish varieties, such as Delaware, Rebecca or Diana, 4×5 feet is a good distance. If Norton's Virginia Seedling, Concord, etc., eight feet is not too far apart. Plant your vines as soon after the fall or winter rains as you can get them, and when done, hill up the rows as you would corn, covering them entirely. If water lies about the vine it will injure or perhaps kill it. When spring comes, plough to within three or four inches of the roots, so as to give them the benefit of the warm Spring sun and invigorating dews at night. As the season advances and the vines grow, level the ground with a horse cultivator.

Clement Detten, in his prize essay, recommends the following mode: After the situation has been selected for a vineyard, break up the soil, by means of a sub-soil plough, to the depth of one and a half or two feet; then lay out the ground in rows, about eight feet apart each way. This distance will permit the use of the cultivator in Summer; but where it is unnecessary to stir the soil after the Winter ploughing, a distance of five feet each way is sufficient. Dig the holes for the vines to such a depth that there will be about one foot of mellow soil below the roots, and of such width that there will be mellow soil at least six

inches on each side of the extremities of the roots. In making the holes, throw the top soil on one side and the bottom soil on the other; take the vine in one hand, and spread out the roots with the other in their natural position; then have thrown some of the top soil on the roots by another man, while you keep shaking the roots so that all the spaces between them may be filled up with mellow soil; press this mellow soil upon the roots, and then fill up the hole with the bottom soil. This is Mr. Detten's mode.

ENCLOSING THE VINEYARD WITH A HEDGE.

If the ground chosen for a vineyard has not already been fenced in, or if only with a slight temporary fence, we would recommend that at the same time the ground is being prepared for the planting of the vineyard, a few extra furrows be made, ploughed and sub-soiled precisely as for the vines, around the outward borders of the vineyard, and planted with the Osage Orange seed, which, with little care and attention, will, by the time the vines are in bearing, make a close and elegant hedge, and a permanent, and, in the end, cheap as well as ornamental enclosure that will protect your grounds and adorn your domain.

The following is, perhaps, as good a mode for planting a hedge as any: Sow the seeds, or set your plants of the Osage Orange from 12 to 18 inches apart; the seed may be put closer, and afterwards thinned; the soil should be rich, and be deeply dug, ploughed or trenched first. If you use young plants, cut them within two eyes of the surface of the ground, and in the following Spring cut down as much in proportion; do not try to get the hedge quickly. The second year after planting—say in June—cut the

sides of the hedge to the shape you wish. The conical is best, as offering most resistance to the action of snow. The third year, cut back enough to ensure a good hedge. If it is six feet high at the end of five years, you do well. And if it reach six feet by slow growth, it will turn a mad bull.

The seeds will require to be scalded in hot water, to make them germinate readily ; in Calfornia they may be planted as soon after the Winter rains as the ground can be put in order.

Five pounds of seed will plant one mile of hedge; each pound contains about 10,000 seeds.

Where land is plenty and cheap, as in California and many other new portions of our country, we would suggest that in preparing and enclosing the ground for a vineyard by a hedge, as we have proposed, a space should be left between the enclosure and the vines of some eight or ten feet, to allow a road-way all around the vineyard, and also to afford room for teams to turn, at the ends of the rows, without trampling down the vines.

PART VI.

LAYING OUT AND PLANTING THE VINEYARD.

Modes of Propagating the Vine: 1, by Cuttings; 2, by Layers; 3, by Rooted Plants; 4, by Seedlings; 5, by Grafting; 6, by Eyes; 7, Hybridizing. Distance apart for the vines; Miller's, Wolfskill's, Haraszthy's Plans; cost of different plans; balance largely in favor of 4 by 4 feet, and the layer system of planting. Table showing the number of vines per acre of the different distances apart. Diagram A, showing one acre planted after that plan; diagram B, presenting a vineyard of 100 acres and 242,352 vines, six years old, at a cost of $10,300; the Dibble, and how to use it; planting and yearly process of managing a vineyard the first six years; list of 444 varieties of grapes for 100-acre vineyard; proper length of cuttings, and how prepared; Nursery for cuttings; Do. for seedlings; mode of packing grafts and cuttings; eyes; hybridizing.

THE vintager having prepared his ground by deep, thorough ploughing, sub-soiling, harrowing, etc., as described in the preceding chapter, will now be prepared to proceed to laying out and planting his vineyard. And here, at the outset, we must meet and dispose of the question as to *how far apart* the vines should be planted. On this question there is, perhaps, a greater diversity of opinion and practice than on almost any other subject connected with vine culture. Many intelligent viniculturists in California and elsewhere have practiced and advocated the system of planting the vines eight feet apart, each way. The well known vineyards of the Wolfskills, in the valley

of *Putah Creek*, in *Yolo* and *Solano* counties, and of Mr. Miller, the pioneer viniculturist and fruit grower of Pleasant Valley, not far from the Wolfskills', have been growing their vines from ten to fifteen years past in plantations laid out from six to eight feet apart; and they have assured us that instead of bringing their vines closer together, they would, if planting anew, plant them still further apart. But it should be stated that those gentlemen have devoted their vineyards almost exclusively to growing grapes for table use, making very little wine; and then, again, their vineyards are on low valley lands, where their vines have a rank, luxurious growth, and require more room to spread than vines planted on hills or hill-sides. And this wide planting has very generally obtained in California, as well as at the East. Even Col. Haraszthy, the experienced viniculturist of the Buena Vista Vinicultural Society's vineyards, one of the largest, if not the most extensive vineyards in the world, commenced his plantations eight feet by eight, and strongly advocated that system, but having, by practical experience, been made to discover his error, he has the good sense to acknowledge it, and to give his reasons, very fairly, for the change of his views. And, as this is a question of so much importance to those who are about starting new vineyards, as well as to those who may find it their interest to bring their wide plantations nearer together by layers, we give, somewhat at length, Col. Haraszthy's plan and reasons for his change, as set forth in a communication addressed to the author of this little hand-book, as editor of the California *Rural Home Journal.*

Buena Vista, January 13, 1866.

EDITOR OF THE RURAL HOME JOURNAL:

In accordance with my promise, I give you a description

of the present mode of my planting new vineyards, and the way of bringing the old plantation from eight feet to four feet apart. Some ten years ago, I planted my vines eight feet apart, and advocated this distance as well verbally to my neighbors as in my essays. The reason for doing so was, that the native Californians had planted from five to eight feet apart; this mode then seemed to me a good one, there being a plenty of land. Economy in ground seemed to be useless; besides, it was advantageous to cultivate vines planted this distance with two-horse plows. Nevertheless, I experimented with close planted vines, but of course it took years before these trials could be conclusively tested. In 1861, when I was sent commissioner to Europe by the State of California, I visited many of the Imperial Vinicultural Gardens; among the rest, that of *Dijon* in France, as well as those on the Rhine, and at Wiesbaden; I found that at Dijon, for twenty-six years, experiments were made in the garden with close plantations and wide, beginning sixteen feet and coming down to one foot; the grapes were, each and every parcel, separately weighed, and made into wine, and it proved that invariably the closest plantation gave the best and most wine. The same result was ascertained in Wiesbaden, and by many private individuals throughout Germany and France. The people all adopted close plantations. Throughout the famous Burgundy district all vines are planted one foot apart; in the Medoc, three feet between the rows; and in the rows, from one to two feet. In Hungary two feet between rows, and eighteen inches in the row. Italy and Spain, where but little progress is made, are the only countries where vines are far apart planted, and your readers well know that their wine is not celebrated. But even there, a few individuals have begun close plantation, and produce

a better wine. The above named facts convinced me that my theory of wide plantation was wrong; still, on my arrival at home, I kept trying my experiments, and found in time that California is no exception in this respect. The intelligent vine-grower has no doubt found that if he permits his vines to bear too heavily they do not develop sufficient saccharine matter, nor do they color well; that is, instead of being very dark blue, they will be pale—a kind of mulatto color. Of course there are soils of very rich quality which will make exception to this; and if the vine is pruned to few grapes, the vintager has a great deal of land to cultivate and gets but little wine. Besides, it takes five or six years before all the vines are bearing. During all this time, the cultivation of the acre of land having six hundred and eighty vines, is going on at a great deal of expense. The annexed tables will give a clear insight to your readers; both of these calculations are from actual experience. Close plantation four feet each way contains 2,722 vines.

Third year, 1,500 to bear out of 2,722 vines, ¾ lbs., is 1,125 lbs. It takes for one gallon first quality wine, 15 lbs. of grapes, yielding

75 gallons at 40c. amounting to	$30	
Second quality, 35 gals. for brandy, 20c	7..	$ 37
4th year, 2000 vines, 1½ lbs. or 200 gals	80	
second quality, 100 gals	20..	100
5th, 2200 vines, 3 lbs., 440 gals	176	
second quality, 220 gals	44..	220
6th, 2400 vines, 3 lbs., 480 gals	192	
second quality, 240 gals	48..	240
7th, 2600 vines, 3 lbs., 520 gals	208	
second quality, 260 gals	52..	260
8th, 2700 vines, 3 lbs., 540 gals	216	
second quality, 270 gals	54..	270

9th, The same, 540 gals..... .....$216
second quality, 270 gals.....54..$270
10th, The same, 540 gals.....216
second quality, 270 gals.....54.. 270

Total produce of 8 years, from one acre..... $1667

Plantation eight by eight feet 680 vines to the acre:

3d year, 340 vines bear ¾ lbs. to the vine, 255 lbs.,
15 lbs. to one gallon, 40c... ..$6 80
second quality, 8 gals..... 1 60..$8 40
4th year, 500 vines, 1½ lbs., 50 gals.....20 00
second qualty, 25 gals..... 5 00..25 00
5th, 600 vines, 3 lbs., 120 gals.....48 00
second quality, 60 gals.....12 00..60 00
6th, 640 vines, 5 lbs., 213 gals.....85 20
second quality, 106 gals.....21 20..106 40
7th, 670 vines, 8 lbs., 358 gals.....143 20
second quality, 179 gals..... 35 80..179 00
8th, 675 vines, 360 gals.....144 00
second quality, 180 gals..... 36 00..180 00
9th, The same.....180 00
10th, The same.....180 00

Whole produce for eight years from one acre..... $918 80
Difference in favor of close plantation..... 748 20

This is a considerable difference in the income of a man who has a vineyard of 100 acres. But the reader will see still another advantage in the close plantation, namely, that the income is a great deal more in proportion in the first, second, third, and fourth years, than in the eight feet plantation, where the income only increases towards the end of the calculation. And for a new beginner, it makes a great difference whether he gets, per acre, in the first three years, $37, or only $8.40; in the four years $100, or only $25, and so on.

But I am told that the cultivation with hand labor, costs so much more; this is erroneous; first, vines four feet apart can be cultivated with horses and plough more easily than corn or potatoes; second, even if persons would wish to cultivate with hand labor, the cost is not more. Annexed is the expense of the Buena Vista Vinicultural Society, for one hundred acres of vineyard planted eight feet apart; however, at that time grain was three cents per lb.:

6 Horses grain for 6 months, 15 lbs. per day each, 3 cts per lb.	$486
12 tons hay for 6 months	240
Pasture and hay for 6 months	124
3 Chinamen drivers working 6 months	468
One man the balance of the year	157
Hoeing and suckering	125
Pruning, etc.	300
Total	$1900

The Society made layers during the winter of 1865 in its old vineyards, bringing the vines from eight feet to four feet, the layers being bent from the old vine into a ditch dug in the ground close to the vine, and brought out four feet from the old stem; of course, for the first year, the vine remains attached to the main vine, consequently can not be ploughed. The cost of one hundred acres of vineyard of this description was as follows:

Pruning	$350
First hoeing with fork-hoes very deep, and spading	1000
Second hoeing and suckering	400
Third hoeing and suckering	100
Total	$1950

But this expense includes officers' salary, wear and tear of tools, while the calculation by horses does not. The

work is superior to ploughing and no vine gets ruined entirely, or cut, which is often the case with bad ploughing.

Thus it appears that the original vineyard of 100 acres, (8 × 8), containing 68,000 vines cost $1,900 per year, while by the layer system, (4 × 4), 100 acres containing 272,200 vines cost only $1,950 per year.

This statement of Col. H. furnishes very strong reasons in favor of close, or 4 × 4 feet, planting, by the layer system. Still those whose grounds or preferences point to a different mode will, of course, adopt such a distance as shall suit them best. Some plantations are made 4 × 4, some 4 × 5, 5 × 5, 6 × 6, 8 × 8, etc.

Number of Vines per Acre. To enable the reader to see at a glance how many vines to the acre will be required for different modes of planting, the annexed table is given. There being 43,560 square feet to the acre, the following calculations will be found as nearly correct as it is practicable to make them :

	Plants per Acre.
3 feet by 3 requires	4,840
3 feet by 4	3,630
4 feet by 4	2,722
4 feet by 5	1,815
4 feet by 7	1,556
5 feet by 5	1,742
5 feet by 6	1,452
6 feet by 6	1,210
6 feet by 7	1,037
6 feet by 8	907
7 feet by 8	780
8 feet by 8	680

The quantity of ground taken for roads, borders, etc., will reduce the above numbers somewhat.

MODES OF PROPAGATING THE VINE.

1. BY CUTTINGS.

We go upon the presumption that where large vineyards are to be planted, as every day shows more and more to be the case, and the planting is to be done by cuttings, which is doubtless the most economical of all modes, the cuttings are to be set directly in the vineyard without waiting to have them rooted in a nursery.

The ground being prepared, as before indicated, let a line be stretched across the field the length intended for the row, with marks made by tying little tabs or slips of cloth to the line four feet apart (or whatever distance it is desired to plant vines apart); or a rod pole may be used, with wooden pegs four feet apart with which to punch the holes to indicate the places for the cuttings. Then let bunches of the cuttings, in parcels of one hundred, or thereabouts, be dropped along the row the distance that number will extend. The planter then takes a sack filled with one hundred cuttings and throws it over his shoulder, leaving the upper ends easy of access; he then takes his dibble and proceeds to make holes for the cuttings. The dibble is made of a billet of wood, three to four feet long, and about two inches thick, with an iron-pointed sheath encasing the lower half of the implement to a few inches above the place for the foot, and with a cross handle at the top, like that of an auger, thus:

In this implement we have made the place for putting the foot in the shape of a stirrup as easier for the foot than the usual mode of making them, with a peg or pin on one side. It would doubless be better to allow the

iron to come five or six inches above and include the stirrup, as being stronger than if of wood. The handle may be fastened into it in a manner similar to that of a spade or shovel: to be made as light as possible, consistent with proper strength. Or the handle may be made altogether of iron; in which case it will need to be much smaller.

Fig. 1.
A Dibble.

With the use of his hands and one foot the vintager presses this instrument into the ground where the cutting is to go, to the depth of fifteen to twenty inches, or whatever depth the length of the cutting may require, leaving only two buds just above the ground. Let the dibble be worked each way to make the hole sufficiently wide; then take it out, put in the cutting, shove the dibble into the ground alongside of the plant, three or four inches from it, and press the earth against the cutting, and the feet on either side of it to compact the earth around it; and then pass on to the next; and so on, until the plants on his back are all set: then take a fresh lot, and go on thus to the end. One man will plant 700 vines in a day in this manner.

Proper length for cuttings and how prepared. As in everything else connected with grape culture, there is in this country a great diversity of opinion as to the proper lengths required for cuttings. Some say 10 to 12 inches; some one foot and a half; some two, and some three feet. Muench says that 10 to 12 inches is ample; Mr. Flint says 12 to 15 inches. Haraszthy proposed two feet; Detten three feet. But, if they be but tolerably close jointed, we think that cuttings 12 to 15 inches long, are about the right length, and will make root more readily than if they are put so deep as not to feel the warmth of the upper surface

of the earth. In the dryer soils of California a length of 15 to 18 inches may be best, perhaps.

The cuttings should be cut from the vines so soon in the Autumn as the leaves shall have fallen and the past Summer's wood, from which they are to be taken, shall be fully matured. Let them be cut off about an inch from the bud, at each end, with an inch or so of the old wood at the bottom. In California they may be used directly after being cut, or so soon as the rains shall have fallen sufficiently to enable the ground to be put in order. Where it is not practicable to use the cuttings as soon as made, let them be tied up in bundles of 100 each, where large quantities are used with the upper ends all one way; bury the lower ends in some cool shady place, until near the time for planting; then set the lower ends in water a few inches deep, until the buds have swollen, when they will be ready for use. In California they may be planted in January, if the ground shall be in proper condition. In the Eastern States they cannot, generally, be planted before the months of April or May.

Nursery for Cuttings. If you wish to have a large number of roots before you lay out your vineyard, you ought to make a vine-nursery. Make a trench somewhat deeper than the length of the cuttings, the lower wall a little oblique, and fill it to the depth of a hand again with good earth; into this stick the slips, and press the earth about the lower ends of them. By opening the second trench (as in trenching), the first is entirely filled, by which the lower wall is made somewhat slanting, and prepared for the second layer of cuttings, etc. The lower ends of the slips should never rest upon rough, unworked soil. In very dry weather water the cuttings in the evening; but the water should not be too cold. The more hardy varie-

ties, as Virginia Seedling, Delaware, etc., may be planted in the late Autumn, and covered with straw. It possesses this advantage, that the lower part commences to bark over in the winter, which must precede the sprouting of the roots, and that the earth gets well settled about the roots while the ground is still damp. It needs no hoeing or watering, and most of the young stalks grow finely. When the time comes for the young buds to swell, they must be helped a little, that they may work easily through the straw, keeping the soil, however, still covered. This mode will, we presume, with little variation, answer for all sections of our country.

2. BY LAYERS.

The planter having determined what distance apart to adopt, is now prepared to line off his ground and mark the places for each vine; but previous to this he must decide whether he will plant rooted vines, or cuttings; and, if the latter, which we believe to be the best, as experience in California has pretty fully established, then he must determine whether he will plant his ground all over at first, or so commence his plantation as to finish out his vineyard by *layers*, subsequently to be made. This latter we believe to be decidedly the most economical plan for those who wish to start a large vineyard with little money. It is set forth very clearly in the communication of Col. Haraszthy, from which we have already made extracts. To make it (says Col. H.) more intelligible, we take 100 acres, plant the rows forty feet apart, in the row the vines are planted four feet apart, this will plant the first year 27,220 on ten acres of ground, and roads included, 12½ acres to cult

vate; second year nothing is planted, but the above vines cultivated; third year the same, but now this winter, from each vine two layers are made, the layers are carried from the row, one each way, four feet, in a ditch, and the top brought above ground and pruned to two buds; these layers and the main stem will bear this year. This operation is repeated every year with the exception that thereafter but one layer is made from each vine; the whole is completed in seven years, so that in the named time the 100 acres are closely planted with 272,200 vines. The advantage of such plantation is this, that a person in the first three years cultivates only the equivalent of ten acres, and after that he increases twenty acres every year; but these twenty acres will bear the very year when he makes the layers, and so he cultivates only paying vineyards. The Buena Vista layers gave the last year 2½ lbs. of grapes in average. The mode is simple and has the advantage of needing no replanting, as layers never miss. The following calculations will prove to you the economy of the new method. Both calculations below are reckoned upon the same basis:

Planting 100 acres, by layers, about four feet apart each way, when seven years old.

Planting ten acres at $30 per acre	$300
Cultivating, three years, at $20 per acre per year	600
Making all the layers 272,200, 1½ cent each layer	4,083
Cultivating, fourth year $20 per acre	800
" fifth year	1,200
" sixth year	1,600
" seventh year	2,000
Total	$10,583

Cost by the old way of planting:

100 acres, $30 per acre	$3,000
Cultivating, seven years, $20 per acre per year	14,000
Total	$17,000

In favor of the new mode $6,417 on one hundred acres; but the produce annually is still more in favor of this mode of planting.

This we think an excellent plan; but we would suggest a slight variation that we believe to be an improvement on the one recommended by Colonel Haraszthy. And that is to plant, at first, the rows thirty-six feet apart instead of forty, as it will come out, in the end, more evenly, and can be completed in six years instead of seven.

To illustrate our idea, we give the annexed plans or diagrams, marked A and B.

Diagram A

Shows one acre laid off in the manner we propose, and planted in rows thirty-six feet apart, and the vines four feet apart in the rows. The single rows of stars in the diagram show how the vineyard appears the first and second years; three rows, the third year; five rows, the fourth year; seven, the fifth year; and the sixth year, as it will be seen in section 6, the vineyard is completely covered, making, after deducting for the road (21 feet), 2,376 vines, or 36 rows, with 65 vines in each row.

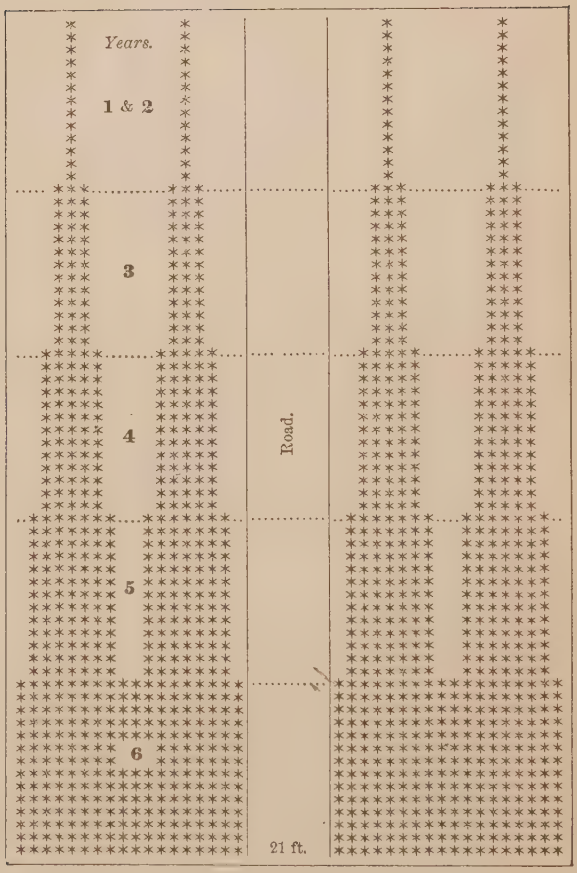

Diagram A.
1 Acre: 10 by 16 Rods.
Scale: 4 Rods to the Inch.

Or, to show the increase of vines per year, and the number to be cultivated thus:

	No. of Vines.
First and second years	264
Third year (2 rows layers added)	792
Fourth " (2 rows more added)	1,320
Fifth " " " "	1,848
Sixth " " " "	2,376

To make this diagram still better understood, we have divided the acre plat into five cross sections. Commencing at the top of the page, the first section shows the appearance of the vineyard the first and second years after planting; the second section, the third year; the third section, the fourth year: the fourth section, the fifth year; and the fifth section the sixth year, or when the plantation is finished.

COST OF ONE ACRE OF VINEYARD BY THE LAYER SYSTEM OF PLANTING, COMMENCING WITH CUTTINGS.

Ploughing and preparing land	$15
264 cuttings	2
Planting do	3
	$20

Increased by layers, in six years, to 2,376 vines; or, by adding the amount of $20 more to the expense, you may have 2,376 vines to your acre, 4 by 4 feet apart.

COST OF PLANTING ONE ACRE BY THE OLD MODE, WITH ROOTED VINES AND STAKES.

Mr. Bull, of Concord, Mass., makes the following estimate for one acre of vineyard:

726 vines at $25 per 100	$181 50
40 loads compost	40 00
Ploughing	6 00
Carting and cross ploughing	3 00
726 poles at one cent	7 26
Planting, two men, ten days	30 00
	$267 76
Cost of cuttings and layer system	20 00
Balance in favor of the cuttings and layer system	$247 76

Or over 1,200 per cent. in cost, besides an increase of over 30 per cent. of vines, which will of itself more than compensate for the difference of time at which the vines will come into bearing. Or, as we have shown, you can have 2,376 vines on your acre for $40.

Diagram B

Represents a vineyard of 100 acres, laid out on a similar plan to that of diagram A, only in blocks of 108 by 815 feet, with roads between every two blocks 12½ feet wide, beside a margin next the roads, on both sides, for the rows bordering on them, of two feet more, making the actual space between the border rows of each block, across the roads, 16½ feet. A main road or avenue runs through the centre of the vineyard lengthwise, twenty feet in width, dividing the tiers of blocks, and into which all the cross-roads enter. Each block is to be planted, the first year, with three rows, lengthwise; the first row being planted eighteen feet from the line of the block or road; the next row thirty-six feet from that, and the next thirty-six f et from that, and eighteen feet from the opposite line or border.

The first year, as shown in diagram A, these rows are planted with vines or cuttings, set four feet apart in the

row. These are cultivated by ploughing, or using a cultivator, say for three feet on each side of the rows, the first

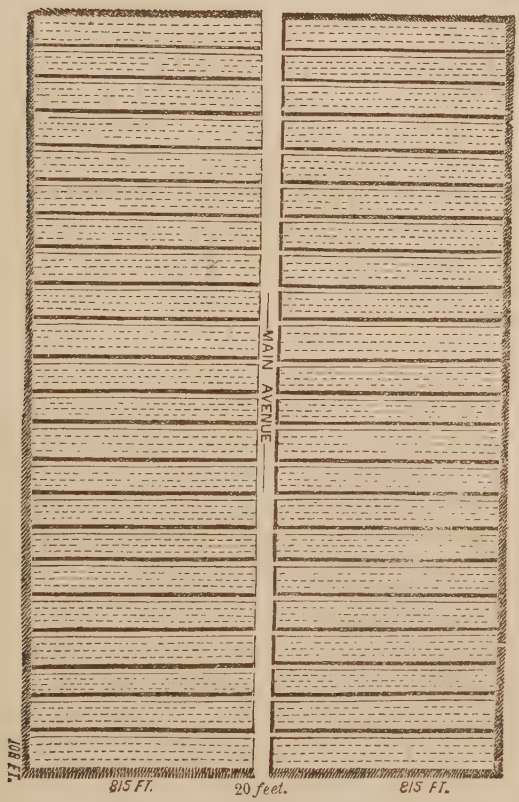

Diagram B.
100 Acres: 100 by 160 Rods.
Scale 40 Rods to Inch.

and second years; or, to make it more intelligble, we will state the matter thus:

First year. Plough, sub-soil and harrow a place six feet wide, eighteen to twenty inches deep, planting the row of vines or cuttings in the centre, four feet apart in the row; which will make from ten to fifteen acres to work.

Second year. Till with the plough, cultivator and hoe, these vines; and plough, also, three feet more in width, on both sides, as a summer-fallow, to be used the next year, for new layers.

Third year. The ground being well prepared, as early as March, or just before the vines begin to grow, start from each vine of each row, one *layer* on each side of the row, carrying them four feet in a trench made for the purpose, by pressing a broad spade into the ground to the depth of nine or ten inches and prying it back and forth; turning up the ends of the layers, let them protrude from the earth far enough to bring two or three buds above ground. About two inches below the lowest bud, where the end of the layer is bent to form the new vine, cut a slit, an inch or so long, with a sharp knife, on the under side of the shoot, upwards and to about the middle of the layer, as at e, e, e, e, in fig. 2. When the layer is laid down, all the buds excepting two or three at the extreme end, and two or three left to produce the roots, should be rubbed off to prevent their sprouting between the rows. During the season break off all surplus suckers, leaving only two or three shoots for bearers, etc., on the new vine. Cultivate, as before, and plough, also, three feet more on each side of the rows, for the next year's layers. This year, if the vineyard has been well managed, and the seasons favorable, both the parent vine and the offshoot may be expected to produce some fruit.

Fourth year. Plough, sub-soil and prepare the borders, this year *four* feet each way, for another course of layers, from the canes or shoots made by the layers of last year's growth, the same as the last year; cultivating also, of course, all the vines previously planted, with a shallow cultivator, so as not to interfere with the layers.

FIGURE 2.

Appearance of the Vines at the close of the Fourth Season.

a. Original cane with four Seasons' growth.
b. b. Layer Plants, with two " "
c. c. " " " one " "
d. d. Where layers are cut apart.
e. e Slits to aid in forming roots.

Fifth year. Proceed the same as the last year, in making one more row of layers from each of the two layers of the last year's growth, ploughing the ground adjoining that ploughed last year, to the width of *five* feet, which will meet the summer-fallow ploughing from the opposite direction.

Sixth year. Plough over, sub-soil, etc., the summer-fallow of last year, and extend the layers four feet more each way; the whole vineyard can now be ploughed both ways; and now the whole ground is completely covered,

as in fifth cross section of diagram A, and we have a complete vineyard of 100 acres, four feet apart each way, containing 242,352 vines, all more or less in bearing condition; and part of the layers having been in bearing from the third or fourth year, enough, it may be fairly estimated, to pay the expense of cultivation for the fourth, fifth and sixth years, and leaving a large margin for profits.

To illustrate the appearance of the layered vines the fourth year, we refer to fig. 2.

Cost of Planting One Hundred Acres by Cuttings and Layers. To sum up the results, the cost, advantages, etc., of the foregoing system of planting, we have prepared the following table, showing the increase year by year, as well as the final result:

		Acres.	Vines.	Cost.	
First year....	To cultivate for vines, $15 per acre.	10		$150	
	" " Summer-fallow, $5 per acre	5		25	
	27,000 cuttings, at $5		27,000	135	
	Planting do., at $2 per 1,000			54	
	Cultivating do., $15 per acre			150	
	Miscellaneous expenses, say			86	
	Total expenses, first year				$600
Second year.	Land and vines to cultivate, per acre, $15	30	26,928	450	
	Replacing cuttings that miscarried			50	
	Total, second year				500
Third year..	53,856 layers to make, at 1½ cts.		80,784	800	
	Cultivating, &c., at $20 per acre	45		900	
	Total, third year				1,700
Fourth year.	53,856 new layers		134,640	800	
	Cultivating, $20 per acre	65		1,800	
	Total, fourth year				2,100
Fifth year ...	53,860 new layers		188,496	800	
	Cultivating, at $20 per acre	90		1,800	
	Total, fifth year				2,600
Sixth year ...	53,860 new layers		242,352	800	
	Cultivating and roads, $20 per acre..	100		2,000	
	Total, sixth year				2,800
	Total cost of planting vineyard of 100 acres, at the end of six years ..				$10,300

SUMMARY OF TOTAL COST *of Planting and Cultivating Vineyard of* 100 *acres* (*with* 243,352 *vines, after sixth year*); *with cost of wine making, tanks, casks, fixtures, etc. Also estimate of the yearly proceeds of vineyard, estimating wines at* 30 *cents, and brandy at* $1.25 *per gallon, allowing* 15 *pounds of grapes for one gallon of wine.*

PRODUCTS OF VINEYARD.					EXPENDITURES.			INCOME.
Years.	Bearing Vines, No.	Grapes, Pounds.	Wine, Galls.	B'ndy Galls.	For Viney'd	For Wine Making.	Annual Total.	Annual Total.
1 & 2	.....	.....	.....	.....	$600 500	.....	$1,100	.....
3	.....	.....	.....	.....	1,700	.....	1,700	.....
4	30,000	212,000	14,000	732	2,100	$3,030	5,130	$5,315
5	90,000	450,000	30,000	1 500	2,600	4,454	7,054	10,875
6	150,000	700,000	46,666	2.318	2,800	5,615	8,415	16,897
7	200,000	1,000.000	66 666	3.125	3,000	6.925	9.925	23,906
8	243,352	1.200,000	72,500	3,640	3,000	7,545	10,545	26,300
9	243,352	1,200.000	72,500	3,640	3,000	7,000	10,000	26,200
10	243,352	1,500,000	75,000	4,000	3,000	7,000	10,000	27,500
							$63,869	$136,893
Cost of 100 acres of land for vineyard, and inclosing same with hedge, at $50							5,000	
Cost of making 18,955 galls. brandy, at 25 cts.							4,438	
Value of 100 acres of vineyard after 10 yrs., at $100						$10,000		
" 243,352 vines " " at 50 cts.						121,676		
" buildings, wine cellars, etc.						16.444		148,120
							$73,307	$285,013
Total amount of profits							.....	73,307 $211,706

DETAIL COST OF WINE MAKING, ETC.

The detail of the cost of tanks, casks, barrels, wine-presses, machinery, and wine making, as estimated in the foregoing table, may be stated thus, for a vineyard of 100 acres, and 243,352 vines:

Year.	Expense of wine making, at 5 cts. per gall.		Press-house expenses.	Fermenting tanks, 4,000 galls. capacity, $130 each.		Barrels for wine when made, at 5 cts. per gall.		Total.
	Galls.	Cost.		No.	Cost.	Galls.	Cost.	
4th	14,000	$735	$870	5	$650	15,500	$775	$3,030
5th	30,000	1,500	1,362	6	780	16,250	812	4,454
6th	46,666	2,333	1,785	5	650	16,950	847	5,615
7th	66,666	3,333	2,092	5	650	17,000	850	6,925
8th	72,500	3,625	3,005	3	390	10,500	525	7,545
9th	72,500	3,625	2,460	3	390	10,500	525	7,000
10th	75,000	3,625	2,460	3	390	10,500	525	7,000

In the foregoing estimate, it will be seen, we have allowed $20 per acre for after-cultivation; the Buena Vista Commissioners state their actual cost to be, in 1864, $6.03 per acre, including the pruning of vines, allowance for superintendence, wear and tear, &c. They think it may increase with the age of the vineyard and hand-cultivating, to $24 per acre.

We have allowed $2 per thousand for planting the cuttings. Mr. Harazsthy, the younger, says one man will put in 700 per day; our estimate will allow $1.40 per day for laborers. They are usually to be hired for $1 per day, that is, Chinese laborers.

In the above calculation we have stated, in round numbers, the amount of land cultivated for vines at ninety acres, leaving ten acres for roads. The more exact calculation would make the roads 11.03 acres, leaving in the vineyard a small fraction less than 89 acres of vines, closely planted, four feet by four; but the number of vines is, as above, 242,352.

All the cultivation required for the roads, is to keep the

grass and weeds from growing. The intervening space between the rows of vines, for the first three or four years, may be planted with such crops as the vintager may choose, taking care that whatever they may be, they shall not be allowed to encroach upon the vines.

The layers may be detached from the main stocks the second year after being laid down, if the layer-plant is sufficiently rooted, as it doubtless will be. Why we propose to put the layers so deep (say 8 to 10 inches), is so as to allow a shallow narrow cultivator, or small shallow plough, to pass over them (say six inches deep), between the newly-formed row and the parent stock, without disturbing the layer. Great care will be required in this respect.

It would be better to *summer-fallow* the ground for the original planting where it is practicable; at all events, it may and should be done every year, as the planting proceeds, as it will enable the cuttings to be put in or the layers to be made either just before or immediately after the first vines, which will ensure their growth, even though the succeeding season should be one of drouth.

Ploughing can be hired done, where the planter has not yet his teams, ploughs, etc., for $2 per acre, where gang ploughs can be used; on hilly land, hill-sides, etc., it will cost more.

In the Massachusetts Ploughman, we find the following on the subject of propagating by layers: We know of no reason why a "*layer*" will not make as good a bearing vine, as one propagated from an eye, or a cutting; yet some horticulturists seem to think that there is some difference.

A *layer* is when a vine is laid down in a trench, a few inches deep, and when the new wood has grown from each

eye a few inches, the earth is thrown in around the canes shooting up, and they form roots at each growing eye, or bud, and by fall each cane becomes a well rooted vine.

In setting out layers they sometimes fail to grow from the buds, owing to being less of them than on vines grown from cuttings; but they will in nearly every case —and in *all* cases, if the roots are kept moist—grow from the shoulders of the roots; therefore let no one consider such a vine as *dead* till it has time to throw up a shoot or two from under the soil, which will be in June or July.

For the forty-four blocks in our diagram of an one hundred acre vineyard, we would suggest the following:

LIST OF FORTY-FOUR CHOICE VARIETIES OF GRAPES FOR A VINEYARD OF 100 ACRES IN CALIFORNIA.

[Each block, when *first* planted, contains 3 rows, and 204 vines in a row, and 26,928 vines altogether; when *complete* 27 rows, and 5,508 vines, and the whole 44 blocks contain 242,352 vines.]

Blocks.	Varieties of Grapes.	First Planting.	When Finished.
3	Black Hamburg, for Wine and Table.	1,836	16,524
3	White Muscat of Alexandria, Table and Raisins.	1,836	16,524
3	Féhér Szagós, R. and T.	1,836	16,524
2	Lombard or Flame-colored Tokay, T., R., and W.	1,224	11,016
2	Black July, W.	1,224	11,016
2	Black Burgundy, W.	1,224	11,016
	Carried forward.....	9,180	82,620

Blocks.	Varieties of Grapes.		First Planting.	When Finished.
	Brought forward		9,180	82,620
2	Larga, or Malaga Bloom,	R. and T.,	1,224	11,016
1	White Frontignan,	T. and W.,	612	5,508
1	Royal Muscadine,	"	612	5,508
1	Black Frontignan,	"	612	5,508
1	Black Prince,	"	612	5,508
1	Grizzly Frontignan,	"	612	5,508
1	Black Morocco,	"	612	5,508
1	White Tokay,	"	612	5,508
1	Rose of Peru,	"	612	5,508
1	White Malvoise,	"	612	5,508
1	Charlesworth Tokay,	"	612	5,508
1	Syrian,	"	612	5,508
1	Verdelho,	"	612	5,508
1	White Sweetwater,	"	612	5,508
1	Black Muscat,	"	612	5,508
1	White Hamburg,	"	612	5,508
1	Golden Hamburg,	"	612	5,508
1	White Rissling,	"	612	5,508
1	Aleppo,	R., T., and W.	612	5,508
1	Red Chasselas,	T. and W.	204	1,836
	Rose Chasselas,	W.	204	1,836
	Black Custer,	W.	204	1,836
	Black Lombardy,	R., T., and W.	204	1,836
1	Miller's Burgundy,	" "	204	1,836
	Bowker,	" "	204	1,836
1	Tribbiana,	" "	306	2,754
	White Corinth,	Raisin.	306	2,754
1	Mission,	T. and W.	612	5,508
1	Muscatel,	R., T., and W.	612	5,508
1	Proximen (Malaga),	" "	612	5,508
1	Catawba,	" "	204	1,836
	Delaware,	" "	204	1,836
	Concord,	" "	204	1,836
1	Hartford Prolific,	" "	306	2,754
	Herbemont,	" "	306	2,754
1	Isabella,	" "	204	1,836
	Iona,	" "	204	1,836
	Clinton,	" "	204	1,836
			26,928	242,352

For a description of the several varieties, see Part VIII., under their several heads. Those who may choose to plant more of the Mission grape, or to make any other change in the foregoing list, will of course use their own discretion in doing so.

3. BY ROOTED PLANTS.

Planting Rooted Vines is a proceeding so well understood that it is scarcely necessary to enter into a detail of the process in this place. It is a much more slow and expensive process than that with cuttings; and must, we think, eventually give place altogether to the modes of propagating by cuttings and layers; nor is there much, if anything, gained in point of time, for the one will come into bearing about as soon as the other, and will, in many localities, make stronger, healthier vines. By the veranda of our consular mansion in China, we planted both cuttings and rooted vines; the former made a growth the first year of twenty-five feet; the latter a few feet less in length, and it bore a few bunches of grapes. As we wished them for shade over our trellised veranda, we did not check their rampant growth, but found that cuttings were a little ahead of the rooted vine in luxuriance and thrift; and thus we believe it to be in other places. The cost of rooted vines and the labor of transplanting them are so much more than cuttings call for, that, excepting in small, choice lots, for the garden or border, we cannot recommend that system of planting. We agree with Dr. Strentzel in the opinion that whenever cuttings can be obtained of thrifty growth, thick, short-jointed, well ripened wood, and of proper length, and can be planted early in the season, they are preferable in

vineyard culture, as the first growth of roots are undisturbed in their natural inclination to grow to their best advantage, and soon overtake rooted vines. Some foreign varieties, yet scarce, and of slender growth, it is preferable to transplant when rooted two years in nursery. Yearling plants have but scanty roots, and these get so mutilated in the process of transplanting, that they are nearly worthless.

But for the information of those who may have rooted vines in their nurseries, and desire to plant from them, and who wish to use stakes for their vines, we give the following directions from Muench, which we think will answer for almost any meridian:

If roots instead of cuttings be procured for the first planting, make by the stake a sufficiently large and deep hole, throw some dirt from the surface into it, hold the stem against the stake and spread out the roots with care in the hole, over which put some loose earth, which must be a little pressed down with the hand. It is a great fault to plant too deep. The upper roots should not lie more than three or four inches deep. (In the dry soil of California they will require more depth.) Make a little mound around the stem lest the plant sink too low when the earth in the hole has settled. If the earth be dry, pour a little water on the roots when planting. Many, before planting, shorten the roots to a few inches, the need of which I do not understand. The more roots there are from the beginning, the better the growth will be. Only in seedlings do I cut off these roots that are too puffy. All the old wood should, in planting, be covered up, and of the growth of the previous year but one or two buds should be left exposed. Roots of one year old should only be planted when hardy; others should be left in their places another year.

For weak roots, mulching, that is covering with straw or leaves, is very beneficial.

In speaking of this mode of planting in California, Wilson Flint says: Rooted vines designed for planting out should be taken up from the nursery before the warm days of February, so that their buds are not swollen. On being taken out of the nursery, they may have their tops shortened back to within one bud of the old cane, and the roots pruned at the same time, when they can be heeled in ready for planting out, which is best to be done either in December or March. Where there are more than one set of roots, it is best to prune the lower ones nearly back to the cane, as this induces, afterwards, a top-like tendency. The upper, or surface roots, may be left longer, and spread out so as to reach beyond the lower ones before they delve downward. This practice, it will be observed, prevents the roots from interfering with each other.

The query of Mr. Muench, our Missouri author, as to the advantage of pruning the roots of vines, is thus answered by Mr. Flint, our California viniculturist.

Col. Haraszthy suggests the following mode:

When the land is laid out, and a stick staked at every point where a vine is to be planted, a hole must be dug twenty inches square and about two feet deep. The ground from said hole is to be laid out as follows: the top ground to your right, the second ground to the left, and the third in front of the hole; then the bottom of the hole should be well dug up with the spade, leaving the last ground in the hole. The earlier the holes are thus finished before planting, the better; then the longer the earth is exposed to the atmosphere and rains, the more it will be fertilized. Before you begin to plant your vines, have the holes filled, for rooted vines, to within about six inches of the top; if for

cuttings, about ten inches. First the ground to your right, being the top ground, is thrown in the bottom of the hole, then that on your left. This done you proceed to planting. When the holes are filled, as above described, if you plant cuttings, have said cuttings two feet long, bend the cuttings ten inches deep in the hole, near to a right angle, the lower part of which is laid horizontally on the bottom, and the upper part on the side-wall of the hole, the top of it to be above the ground three inches; then fill the hole from the ground surrounding it, which, of course, is top earth; then tramp the earth first on your cutting, that no vacancy shall remain in the hole, otherwise foul air will gather in the vacuum, and the cutting become mouldy and die. But if you plant rooted vines, your holes will be filled to six inches. Now take your rooted vine, spread the roots on the bottom, and throw from the surrounding top ground on the roots; shake them well, so that the pulverized earth shall get amongst the roots; then tread gently with your foot around the plant. After this the ground is to be so leveled about the vine as to leave a dish-like excavation around the same, as a receptacle and conductor of moisture to the roots. Be careful never to plant your vines too deep. It is better if you make a mistake to have them too shallow than too deep.

The suggestion of Col. H. to have a small sink-hole left about the plant, is different from that of Mr. Muench, who proposes to hill it up for settling. We should think that if the ground were left even, it would settle enough to allow of its gathering the moisture, which is, of course, more necessary in California than in the Eastern States.

4. BY SEEDS.

The following is the process as given by the editor of the Rural American: We have grown seedlings extensively, having now some 2,000 bearing seedling vines, or old enough to bear fruit, and will describe our system of propagation, etc.

The first seed sown, in 1860, was sown in drills, about one foot apart, in November. The seed was scattered thickly, perhaps one hundred to the foot, in a drill three inches wide and one inch deep. We covered the seed about half an inch deep with fine garden soil.

The following spring we watched the drills closely, but saw nothing but a rank growth of weeds, till about the 10th of June, when the seed vegetated, looking very much like peppers when the plants first appear, with two leaves, rather broader than those of the pepper plant.

In a few days the rows were covered with the plants, and soon the third leaf appeared, which had all the shape, form, and characteristics of the full-sized grape-vine leaf. We weeded out the rows, and kept them free of weeds till Fall, when we had several thousand young vines, grown closely together, but each with a small well-ripened cane, a few inches long, and with good roots. In November of 1861, we dug them up with a vine fork, without much disturbing the ground, as we expected a *second crop* of vines from the same seed the following June. We laid the vines upon the surface of the soil, and covered them in layers with earth, and left them till the following spring, when we set them out in rows five feet apart, and two feet apart in the rows, for the purpose of allowing them to remain there till the time for fruiting, which is in the fourth and fifth years. We now have a large number that will

produce fruit this year, some of which will, probably, be worthless, and some good; and possibly one or more vines may produce a really valuable grape.

In regard to the *second crop*, alluded to above, it came in June, quite as numerous as that of the preceding year; and here we will observe, that Dr. Bull, the originator of the Concord grape, thinks that the *best and strongest* vines come up the second year. We, however, see no good reason for such an opinion.

The second lot of grape seed sown was placed in a box (there was a half a bushel of seed) holding four bushels, in November, 1864, and mixed with earth, filling the box, and left standing in our garden through the winter of 1864–5; and about the middle of May, 1865, it was sown in drills, came up in June, and now we have a large crop, second year's growth, in the same drills.

5. BY GRAFTING.

Still another mode of cultivating the vine is by *grafting*. This may become necessary when the vintager finds, after his vines begin to bear, that his fruit is of an inferior quality, or where he wishes to improve upon his old varieties. And in small gardens, or borders about the house, it is an interesting and pretty sight to see a little grape tree or vine, containing half a dozen or more varieties of fruit, combining all shades of color and variety of sizes. Mr. Miller, the pioneer orchardist and viniculturist of Pleasant Valley, Solano County, in this State, grafted his whole vineyard of many thousands of vines, which were of the Mission or California varieties, some years since, with the choicest varieties of European grapes, which are now in

full bearing, embracing the Black Hamburg, the White Muscat of Alexandria, the Chaselais de Fontainbleau, or Royal Muscadine, as it should be called, etc. And finer, more luscious fruit than is grown on these vines, we have rarely seen produced in the finest grape-growing regions of the Mediterranean. From one block of 2,000 Muscat of Alexandria, Mr. M. informs us that he had, last year, (the third year after planting), an average yield of one dollar and a half per vine! Out of some 30,000 growing vines in his vineyard, he has only two or three hundred of the California natives—those being vines that the grafts failed to grow from.

Dr. S. J. Parker, of Ithaca, N. Y., suggests the following mode of grafting the grape: The most successful way to do it is to dig up a root of the Isabella, as that will grow anywhere south of Canada, and cut it in lengths of three inches to a foot long, according to the rapidity with which the vine is desired to be grown; insert the scion into the upper end of this root stock. This can be done at any time of the year, but early spring is the best for this mode of grafting, whether for pots or to be put out in the open soil on "borders," that mysterious word to most farmers, but which means any suitable fence out of doors, in its common acceptation. A friend of mine is very successful in grafting; he recommends one year old Isabella vines, not pieces of roots.

A Long Island cultivator grafts the grape vine the same as he does pears, apples, etc., and, he says, with almost invariable success. He sets on young side-shoots near the bottom of the parent or main stem, and as close to it as it can be done. He uses basswood matting for bandaging the grafts and well-worked clay, and over all some moistened moss. He has had them to ripen from ten to twelve

feet of wood in one season. We see no reason why this should not succeed as well as other grafting.

On this subject Mr. Detten says: By grafting, with good judgment, the maturing of the grape may be hastened, or its quality improved, or both. For this purpose I would recommend grafting by approach. In doing so, the stock or branches of two different vines are brought together, slicing out a corresponding portion from each, and binding the two together, the wood and bark correctly fitting. Cotton twist may be very appropriately used for binding them together. Then tie to a stake until union be effected. When union is complete, cut away the vine which is not wanted above and the root of the other vine below, and the grafting is finished.

These examples are sufficient to show what can be done in the way of propagating the vine by grafting, where it becomes necessary to do so. But, as we have already indicated, of all the modes for propagating and cultivating the vine, we give the preference to that of using cuttings and layers.

Mode of Packing Grafts and Cuttings.

When it becomes necessary to bring grafts, cuttings or scions from a distance, the following method is the one substantially proposed for packing them, by Muench, in his School of American Grape Culture:

First wrap them in damp moss, or wet cotton, or even a wet newspaper will do; then cover them closely with oil silk, or thick oil cloth (paper?), and over this a thick paper on which the address may be written. Write on it "Grafts," which will make the postage quite low. [The

U. S. postage is two cents for every four ounces, or eight cents per pound, for parcels not exceeding four pounds each.—Author.] The recipient should take the wrappers off immediately, mark down the varieties, and then bury the scions in the earth until grafting or planting time.

In Copeland's Country Life, we find the following: It is very easy to send cuttings to great distances without destroying their vitality, if placed loosely in a tin case, with half a table-spoonful of water, more or less, according to the size of the case, which should be hermetically sealed.

If placed thus loosely in the case, we should think they might be injured by shaking about and breaking the buds off, or injuring them. If a little cotton were wrapped around them, it would doubtless obviate this danger; or put them in an air-tight tin can with powdered charcoal, moistened slightly, is said to preserve them perfectly.

6. BY EYES.

The eyes should be prominent, well developed, and on the last year's wood; cut an inch above and an inch below the eye; select a number of small pots or boxes of five or six inches in diameter, fill with rich light loam, leaving small apertures at the bottom for sufficient drainage; set the cuttings so that the eye shall be covered by at least an inch of the loam. The pots or boxes should have a bottom heat of 70° to 80°, and the air kept at a temperature of 60°; the buds will soon begin to germinate; keep the earth in which the plants are a little moist. As soon as the shoot is above the surface, water occasionally, and take care that no worms get among the plants. In a month or there-

abouts they will become fine plants, six to eight or ten inches high, and may be removed to the garden or borders where required to grow.

Or, instead of the above mode, which we find recommended by Copeland, the buds or eyes may be planted out directly in the nursery or propagating ground.

Mr. Barry, the well-known pomologist of Rochester, N. Y., on returning from a recent visit to the Lake Shore Vineyard, on the Ohio borders of Lake Erie, speaks thus, in the Rural New Yorker, of the propagating grounds connecting with those vineyards: It is estimated that nearly a million of young plants are on the grounds, all propagated from eyes the present season, in the open ground. They are planted closely, three or four inches apart, in beds about four feet wide, and all covered an inch or two deep with tan-bark. Except in some spots, where the wood was defective or the soil unsuitable, the crop is quite satisfactory. Mr. B. says the Catawba is still the prevailing grape grown in those vineyards.

This system of prapogating, however, can scarcely be recommended for general use, except where it is desirable to multiply choice varieties that are scarce.

7. BY HYBRIDIZING.

This is a system of producing new varieties of the grape by crossing the different kinds by means of mixing the pollen of the flowers of the varieties chosen to experiment with. This is a very interesting study, doubtless, to those who have the time and patience to experiment, but it is rather a slow process for Californians to pursue at present, to any great extent. Still for the satisfaction and convenience of

connoisseurs and of those who may possess the taste, patience and time to pursue this interesting branch of natural science, we will transcribe a brief extract from a description of the process, as embodied in an interesting paper on this subject, written by Dr. J. S. Parker, of Ithaca, N. Y., and published in the Report of the Department of Agriculture for the year 1864:

The grape opens its flower by a singular process, different from most other plants. We see the cherry, peach and apple expand their petals, and retain them with their white or red colors several days; but the grape has its petals so united at the top of the flower that, as it opens, the petals are drawn off from their attachments and cast off in a sort of hood that falls to the ground, leaving the stamens and pistil naked. If there is any difficulty in making hybrids it is in the removal of this hood, which should be done as soon as it is loose, and before it is naturally thrown off, and so to do it as not to jar down the pollen of the stamens on the top of the pistil, for I have often seen the pollen fall like a minute cascade of yellow particles, so heavy it is, and so direct and rapid its fall. Notwithstanding this apparent difficulty, the hood can be easily removed by the use of forceps and scissors no more delicate, nor by hand more steady, than is required by the surgeon in many cases daily demanding his skill. One circumstance I have not seen noticed; it is, that as soon as the hood of petals is off, the top of the pistil begins to be covered with a minute globe of transparent fluid, beautifully clear and highly refractive, glistening like a dew drop on the top of the pistil. It takes usually from a few moments to an hour or two, according to the weather, for this minute globule to be perfected.

Now, no impregnation can take place unless this minute

drop of fluid is secreted so far as to receive the pollen—that is, until it is almost or quite expanded to its full extent, which is rarely before the petal hood has fallen whether by art or nature. One more fact—the pollen falls on, adheres to and sinks into this minute drop; and as soon as a sufficient quantity has thus been received by this drop of fluid it becomes turbid or milky, losing its transparency, and is drawn into certain pores or tubes, which are seen by their mouths as roughness on the stigma, which is the enlarged portion on the top of the pistil. Thus if the pollen is abundant, and the weather favorable, a few hours may suffice; if not, a day or two, or even the third day, may be required to complete the impregnation. After the third day I have not noticed the drops of fluid, even when the impregnation failed, the top of the pistil being dry. A rain may wash this drop off; and hence, though the season is otherwise favorable, there may be a large failure of grapes, though the drop is often renewed, at least once or twice after an accident. . . . . Early in the morning of the first day of the opening of the flowers, at or soon after daylight, a few of the petal-hoods fall and a few drops expand, but not many until the genial warmth of nine or ten o'clock is reached, which is the most favorable hour for the operation of hybridization. The operator then taking his stand close by the bunch of flowers, cuts away those that have opened and expanded the drop fully, while he watches for the loosening of a number of petal-hoods; these he immediately removes, either with fine forceps or the point of fine scissors, his eye closely watching whether any other bursts and lets fall a stream of pollen on the somewhat expanded globule. At this stage there is no fear of pollen dust; it falls, as I have said, heavily and quickly downward. If the globule of the pistil has

escaped this danger, the operator allows a moment to pass, that the others may expand or bend outward on their stems when he cuts them away. Thus he selects and operates on as many flowers as he desires, or which open that morning. He now watches the maturing expansion of the minute globules on the top of each pistil, and as soon as they have acquired a full roundness, curving to the smaller vase by which they rest on the pistils, he knows they are ready to receive the pollen artificially. On a favorable day this takes but a short time; in less favorable weather hours may be needed, and in bad weather even a day or two. But when the right moment has arrived he dusts the globule freely, sprinkles it with an excess of pollen, then waits a few hours to see if the globule has lost its clearness, and is withdrawn down into the recess of the germ to perfect the seed of the future grape-vine. If so, then the hybridization is complete; if not, he must re-dust the globule every few hours while it is visible.

These extracts, all that we can find room for in our little work, intended only as an epitome of grape culture, rather than an elaborate scientific treatise, must suffice; they will doubtless give the reader some idea of this interesting process; and those who intend to pursue the subject extensively, will find it necessary to have recourse to more elaborate works on the subject.

The kinds of grapes recommended by Dr. Parker to use for fertilizing our native varieties, are the Black Hamburg, the Chasselas, Musqué, White or Gray Frontignan, and the White Muscat of Alexandria.

Mr. Edward I. Rogers and John Fisk Allen, both of Salem, Mass., are the only two gentlemen that have, as yet, we believe, produced any very valuable new varieties of the grape from this system of hybridizing; if we except,

perhaps, Mr. Jacob Morr, of Rochester, and a few others, of less note. The Clover Street Black, and the Diana Hamburg, produced by Mr. M., are said to be fine varieties, and will be found more fully described under our head of Native Varieties of Grapes.

PART VII.

PRUNING AND AFTER-CULTURE.

Diversity of opinions and practice on the subject of Pruning; how it is done in Europe,—Malaga,—Morocco; close pruning considered necessary to produce fine flavored grapes or choice wines; the vine must be trimmed, and how; pruning should have reference to the formation of wood for the coming year, and the forming of fruit in the present; various authorities on the various modes of pruning; pinching-in; Mr. Flint's description of a model vineyard in El Dorado County, and the way it is pruned; pruning should not be done while the vine is maturing its seed; low pruning preferred; Col. Haraszthy's opinion; no staking or irrigation necessary; summary of pruning operations for each year; Summer pruning and suckering; modes of pruning and training at the East; Grape Hints for the vintager; save your cuttings, etc.

HAVING in the preceding pages discussed the various modes of planting and propagating the vine by cuttings, layers, rooted plants, seedlings, grafting, etc., we will now proceed with the process of Pruning and after-culture of the vineyard.

And there is on this branch of our subject, also a great diversity of opinion and practice. In this country, and especially in the Eastern States, vinegrowers have been so long in the habit of training their vines over arbors, trellis-work, or with stakes, that it has come to be a settled prejudice, as well as practice, to consider the vine as unable to stand alone, or to be successfully cultivated without some or all of these accessories, notwithstanding the expen-

sive nature of many of them; and this, too, in the face of the well known facts that in nearly all the most extensive and model vineyards of Europe, where viniculture has become a practical science, and a leading element in the productions of the world, all such useless appendages and accessories have been discarded and ignored, and the vine been made to stand alone and unsupported, and bring forth its beautiful clusters of luscious fruit without the extraneous aid of stake or trellis.

Mode of Trimming in Malaga.—In passing among the vineyards of Malaga, in the month of April, the appearance of the vines was most singular, especially to us, who had been accustomed to see vines trained to a trellis or stakes; as these Malaga vines, having been trimmed back close, leaving only three or four spurs on the stock or stump, which was scarcely a foot in height, the young shoots were springing up from the spurs of the previous year's growth, forming a rounded head of foliage, resembling, a little way off, hills of tomatoes or beans; they were about four feet apart each way, and extending far up on the hill-side plantations.

But this close trimming is necessary, to ensure the choice rich fruit for which Malaga is so celebrated.

The Mode of Trimming in Morocco is somewhat different. There they let the vines trail on the ground, trimming off only the lateral shoots, leaving the main branches to grow *ad infinitum*. They do not, of course, get as fine grapes by this means, but the Moors are not very particular on that score, although, when they occupied Andalusia, they were among the most skilful and successful horticulturists in the world.

We may describe these vineyards of Malaga and of the Moors more particularly in another part of this work.

THE VINE MUST BE TRIMMED, AND HOW.

The vine will produce fruit, without any trimming or pruning, as we see by the multitudes of wild vines that festoon the lofty forest trees in our primeval woods; but the wild Fox or the Scuppernong will hardly compare with the noble clusters of delicious grapes that are found on the dwarfed vines of our gardens and vineyards. As another writer has tersely said, the aim of the pruning should be the forming of wood for the coming year, and the forming of fruit in the present.

It is clear that some system of trimming must be adopted; and what shall it be? This, as has truly been said, is another Gordian knot. On this subject Dr. Strentzel remarks: many persons, basing their assertions on experience, declare that it is injurious to check the natural growth of plants, especially the vine, as it tends to curtail their longevity and deteriorate the quality of the fruit; that by curtailing the length of the growing canes we destroy the balance of power between them and the roots, and that the vine must eventually perish from that cause. Others, again, *in extremis*, advise to nearly denude the vine of foliage and take off the principal growth of wood. Now, to these it is hardly necessary to answer—though the proceeding, once tried, is an experience dearly bought. So we take the responsibility of advising all new beginners not to follow it.

It is not so with the first class. Now we assert that judicious trimming is indispensable to the production of fine fruit, to which, probably, the experience of most cultivators will assent; but we further assert that there cannot be a balance of power lost, because the growth of

roots is governed by the growth of the branches, and by curtailing the superfluous wood, we obtain an extra supply of nourishment for the fruit, or for new wood, as the case may be.

Mr. Flint in one of his prize essays, makes the following observations on this subject, in which we concur in the main.

After years of experiment (says Mr. F.), the writer finds that the best mode of training the grape in California is to form the heads of the vines within from six to twelve inches of the ground, allowing a greater number of branches to grow as they attain age. It will be seen that this plan saves the cost of stakes, and the labor of tying up the vines. But its greatest advantages are, that this low or horizontal pruning induces a more equal distribution of the sap, so that the buds break equally strong their entire length, and the foliage shelters the grapes from the scorching sun, and affords a blanket at night to keep the warmth of the earth around the grapes. The vines, also, by spreading out over the land near the surface, act as a sort of mulching, which greatly aids in the retention of moisture. A marked difference can be observed in the size, flavor and time of ripening, of grapes of the same sorts when trained high, or low, as those produced near the ground under the shelter of ample foliage, will be ripe two weeks earlier, and of far higher flavor, as there is no interruption in the elaboration of the leaf juices which become their dewy nectar, as the leaves near the surface are not chilled, while those exposed to the circulation of the cold night air receive periodical checks, which cannot but result unfavorably to the fruit.

Much injury is done the vine by injudicious summer pruning, as it checks the swelling of the grapes until new

foliage has grown out. It must be kept in mind that the grape gets most of its food from the vine leaf; therefore, as this is despoiled, the grape proportionally suffers. Then, the denuding the vine of its foliage, hazards the fruit to the danger of sun-scald. If the vine has been planted in proper soil, and not unduly stimulated by irrigation, it will make no more growth than the demands of the swelling grapes upon its foliage require; but if on moist, rich soil, or excessively irrigated, the canes will be long jointed, with poorly developed buds, for the succeeding year's fruit bearing. This defect can be remedied, to some extent, by what is termed *pinching in.* This may be performed at any time while the vine is in a growing condition, in this wise: Take the soft, succulent end of the shoot, between the thumb and end of the forefinger, closing the nails together with a quick motion, when the vine will snap off. Breaking the vine where it is succulent, allows the sap to flow towards the end of the vine, for some time, all the while becoming gradually stopped in its course, which has the effect of forcing portions of it into the buds near the old wood. These buds are the ones to become bearing shoots, and are by this process strengthened and enlarged, in consequence of the descending sap being thrown back upon them by the stoppage of its flow upwards, caused by pinching. If the vine had been shortened by trimming, the knife would naturally strike where the wood had become hardened, and the amputation being in the vicinity of matured buds, these would receive the upward flow of sap, and break at once into wood branches, thus continuing the scarcely interrupted action of the sap vessels.

Mr. Flint, also, in another able paper on the subject of grape culture, in the Report of the Department of Agriculture for 1863, says:

In a dry climate, like that of California, where it becomes an object to shade the ground, I find that close planting is best, if a system of pruning is adopted in accordance. The best managed vineyard I have ever seen, is that of Martin Alhoff, Coloma, Eldorado County, California. There are in this vineyard some thirty thousand vines, largely comprising Black, Burgundy, Catawba and several Hungarian varieties. The land slopes to the northwest, and is a decomposed granite. The vines are set in rows, six feet apart by three feet, and are pruned to low heads which are formed but a few inches above the ground. The pruning which is practised is that known as the annual renewal system. Few canes are allowed to bear, but these are permitted to have from two to four bunches of grapes to the cane, according to the age and strength of the vine.

The practice of Mr. Alhoff accords with my own experience, which long since convinced me that the best flavored and largest bunches of grapes were always to be found on those vines which had their bearing branches nearest to the ground.

The best time of year in which to trim the vine back for bearing, has been a subject of a great difference of opinion among vine growers. My experience teaches me that if the object be to obtain a strong growth of wood, the vine should be cut back soon after the fall of the leaves late in autumn. By this course the buds nearest the ends of the spurs will be stimulated by the first flow of sap in the spring, and the new canes grow with accelerated vigor by having received the entire force of the early ascending sap. But if the object be to obtain grapes, late spring trimming is always most favorable, as by permitting the strong and copious first flow of sap to pass along and be-

come distributed among the terminal branches, the buds, which are the reliance for fruit-bearing, remain dormant until all danger of frost or chilling winds shall have passed, when, on cutting the vine back to the proper place, these buds will throw out large vigorous fruit-spurs, and the entire vine get uniformly into bloom. I have never yet discovered any injury to the vine and the grape crop by what is termed the bleeding of the vine by reason of late spring amputations; but, on the contrary, believe that not only is the vine exempted from the late spring frosts by such practice, but that it is not likely to suffer from mildew, when this time of trimming is adopted. I have frequently deferred trimming until the ends of the vine had expanded the foliage so that the shoots were starting; but these same vines ripened their grapes quite as early as any in the vineyard which were trimmed at an earlier season, and the grapes on the late pruned vines were almost always fairer, and the bunches larger than on those which were dressed by the vintner in the Fall.

The Stockton Independent has the following in reference to trimming grape-vines after the fruit is set: About the time the grapes grow to be the size of peas, the stone or fruit begins to harden. While this work is going on the berries usually gain but little in size, and for a term of ten days or a fortnight stand apparently still. The vines, at this time, are supposed by many intelligent cultivators, to be performing their hardest work—that of maturing the seed, which is really the proper fruit of every plant. During the season when the vine is maturing its seed many contend that the knife should not be used on its branches, as shortening its branches at this time has an injurious effect upon the fruit, inasmuch as it sends a flow of sap to the berries when they are not in a state fitted to

receive it. The result of pruning or checking the shoots at this season may be frequently observed by the berries bursting and the seed sticking out at the side. Those who manage growing vines under glass in the Eastern States and Eastern countries carefully avoid pruning much, if any at all, between the time the berries stop the first swelling and commence the second. It will be observed as a general thing that as soon as the stony part of the seed becomes hard and brittle the fruit will take a sudden start in swelling, and so continue until it reaches the full size and commences to color, the first degree of the ripening process. It will also be observed by practical cultivators that grapes are seldom liable to mildew after they begin to ripen.

Low Pruning preferred. Colonel Haraszthy says: After several experiments, made on a large scale with vines pruned high and staked, and with vines pruned close to the ground, we have become convinced that low pruning, close to the ground, is the better mode in California; it gives better grapes, and ripens them a fortnight sooner. In consequence of these experiments, I left off, some years ago, high pruning and staking. My travels in Europe have proved to me the correctness of my experiments. There is but one view, that the closer you can keep the grapes to the ground the better they are. It would not do, however, to let the bunches lie on the ground, as the summer rains would rot them; but in California and the South of Spain the grapes may and do lie on the ground, and on that account are sweeter.

Mr. Detten says the body of the vine should never get over one foot above the ground.

No Staking or Irrigation Necessary. We have shown that no staking of the vines is necessary, in vineyard cul-

ture; and we now propose to show more directly than we yet have done, that no irrigation is necessary.

Mr. Flint says: It was thought until recently, that the vine would require irrigation in California, in order to be able to mature its fruit. This notion is being rapidly exploded, because it is proved that where the soil is kept in friable condition by cultivation until after the close of the rainy season, the vine will make a sufficient growth of wood and foliage to mature the fruit, and furnish bearing canes for the succeeding crop of grapes.

The Buena Vista Vinicultural Society's managers say: No staking or training is required. They are planted in rows from three and a half to four and a half feet apart, each way, and are cultivated by Chinese laborers in the manner known as the flat way of cultivating Indian corn in the Eastern States.

Dr. Strentzel says: Irrigation, with a few exceptional cases, is most injurious, in vineyard culture.

This, we believe, is the opinion and practice of the most successful and experienced vine growers in California; and it is not necessary in this plan to multiply authorities. Even in planting cuttings, or new young vines, it is not necessary if planted when the ground is moist.

SUMMARY OF PRUNING OPERATIONS.

We may sum up the operations of pruning for the first few years of the new vineyard thus:

First year. No pruning necessary during the summer. When the buds begin to push into growth, select the stronger and rub the others off; a bud near the ground is preferable to one that is a foot above. In the autumn, if

the vines are intended to furnish layers, they should be pruned with reference to that; leaving two strong thrifty lateral branches, right and left of the rows, near the ground, for the layers, and one good healthy cane for the main vine; the latter to be cut back to two buds.

Second year. At the usual time, in the autumn, cut back the main cane to two buds again; take off, also, the lateral shoots on the layer-branches, excepting two or three near the ends, or, perhaps, it would be better to remove them, as you would suckers, during the summer, letting the layers run on until they shall become five or six feet in length, when they are to be laid down to make the additional rows, one on each side of the old row, as per Diagram A, p. 86.

Third year. As early as April, the ground having been previously prepared, the trenches made eight or ten inches deep, with a spade, as previously suggested; let the two layers from each vine now be put down, to make the additional rows parallel to, and four feet from, the original rows; all the buds of the layers, saving two or three at the end of the layer, and two or three more, at the bend, where it is to take root, having been rubbed off, to prevent their sprouting between the rows; and to be put thus deep to allow a very small cultivator-plough to pass between the rows, without disturbing the layers; six inches deep will be sufficient for the furrows to be made. Let these layer-heads now to become standards or canes themselves, to propagate other layers from, be cultivated during the season in the same manner as the original standard vines; all other suckers, or superfluous shoots, save those intended for the next year's layers and for the standards, be trimmed or pinched off as they appear. If this be thoroughly done there will be but little pruning to do in the autumn,

excepting to cut back the main stems to three or four buds, as before. It should be borne in mind that fruit buds grow upon the same branches but once. Some fruit will doubtless be produced this year from the layers as well as from the main vines.

Fourth, Fifth and Sixth Years. Same process to be pursued, as in the third, only, in these years, but one layer is to be made from each layer-head of the previous year; and each succeeding year, the layer-branch, connecting, under ground, the layer-head with the main vine, to be cut off, with a sharp spade or other suitable instrument, as shown at *d*, *d*, in Fig. 2 (p. 91); or, if in the way, they may be cut off nearer the main vine, in two places.

After the sixth year, the layers having covered the whole vineyard with vines, four feet apart, the further process of pruning, suckering, etc., will go on, as in an ordinary vineyard.

Summer Pruning. Dr. Strentzel speaks thus of the necessity, under certain circumstances, of summer pruning: The renewal mode of spur-pruning is especially adapted for vineyard culture in California, and this requires, particularly, persistent summer pruning. It should be commenced by pinching the topmost bud as soon as the canes have grown two leaves above the topmost raceme or blossom. This will strengthen and develop the wood at the base of the cane, and prevent their breaking by heavy wind. This is the time to remove all suckers, leaving only the desired number of the strongest canes. With the advancing growth the process is again repeated on the new topmost shoots; then the laterals will expand. These should be shortened above the third leaf. [With the exception of those intended for layers, the Doctor would doubtless have added, if he had had that process in mind,

when writing this article.—Author.] As in vineyard culture it is almost impracticable to perform the work in the exact necessary time, the overgrown cane tops can be rapidly shortened in with a knife, with the precaution to spare three or four leaves above the fruit, which will leave the length of canes about three feet. The process will have to be repeated when the new growth requires it, but with this caution, not to destroy the old, fully grown leaves, and each new (surplus) shoot to be cut above the topmost grown leaf.

On this subject Col. Haraszthy says: The native Californians never used to prune vines in the summer, but let them grow any length they pleased. This is erroneous. Every person on reflection, can at once see that the sap required to grow and produce vines ten, and often twenty feet long, may be better used if it is forced into the grapes. Undoubtedly the berries and bunches will be larger if moderately trimmed; besides, this trimming is a great advantage when the grapes are gathered, as the picking is so much easier than in an untrimmed vineyard, where everything is tangled up. The best mode is to cut the tops of the vines to the height of five or six feet from the ground, in the month of July for the first time, and the second time in the middle of August. This operation is done easily, and pretty quick. One man with a sickle tops off about two thousand five hundred a day. Besides the above-named advantages, there is one more, viz.: when the top is cut off, everywhere small vines will spring out and form dense leaves on the ends of the vines, keeping the grapes growing underneath in a moderate shade, and making them thus more tender, juicy and sweet. It is therefore a great mistake, practiced often by new comers from modern Europe, that they will break out the so-called

suckers; that is, little branches starting out behind the leaf, and growing feebly up to the length of a few inches. These, in the northern parts of Europe, are broken up, but not in Italy, Greece, Smyrna, etc.

It will have been seen that Mr. Flint does not fully concur in the views of the authorities just quoted in his advocacy of summer pruning. Mr. F., however, agrees to the pinching process, and thinks it necessary.

As to these two seemingly conflicting opinions, we think the difference is more imaginary than real. There may be cases in which the summer pruning of the vine, as, for example, in vineyards where there is but a moderate, scanty growth of the canes and laterals, would be not only unnecessary, but absolutely injurious.

On the other hand, where there is a redundancy, a rampant growth of wood, a slight trimming of the luxuriant shoots, or a thorough system of pinching in may not only be beneficial but necessary to the perfect development and maturing of the fruit, and the future health and prosperity of the vine. But in all cases, where summer pruning is deemed necessary, it should be done with the utmost care, that it be not overdone; and furthermore that it be not done at all when the fruit is forming its stone, that an extra flow of sap be not forced upon the fruit when it is thus not in a proper state to receive it.

Very little summer pruning will be necessary if the redundant suckers be removed at the proper time, and the *pinching in* process be properly carried out. A writer in a late number of the Country Gentleman, has the following summing up on this subject: The useless buds should be removed and the fruiting shoots stopped at a period of their growth when the finger and thumb are sufficient for the work, and hence it should be a rule with every vine-

dresser that any summer pruning which requires a knife shall be left undone.

Modes of Pruning and Training the Vine at the East.

At a meeting of the New York Fruit-Growers Club the principal matter discussed was the *pruning of grape vines*, by A. S. Fuller, with examples. With a yearling vine he showed how to clip the roots to prepare them for planting, leaving none over fifteen or eighteen inches, because it is important to get fibrous roots started near the main trunk. In planting, if in Autumn, set the roots about four inches deep, leaving the cane a foot or two long, which should be cut away in the Spring level with the earth. Grow but one cane the first year, which—of strong growing sorts—will reach ten feet in length. Cut this cane down to four eyes in November and allow the two lower ones to grow next Spring, and train them upright. These two canes are to be cut back in November to about five feet, and next Spring are to be bent down in opposite directions, and each shortened to four feet and tied to stakes or wires or slats of a trellis, to grow fruit-bearing canes. Plants being set just eight feet apart, the ends of arms from each will meet and fill all the space. If the vines are of the short-jointed varieties every other bud may grow, and every one upon long joints, thus giving five or six uprights to each arm. The third year from planting, each upright may ripen two bunches, say twenty four bunches to a vine. Next March cut back each upright to two buds and grow two canes. Afterwards cut the upper one of these two, and so on of others, entirely away, and cut back the lower to two buds, which are to grow two new canes. This keeps the bearing wood down to a low head, the arms being trained to any height desired.

A well established vine will produce 50 to 75 bunches a

year upon a trellis only four feet high, which allows rows to be set six feet apart, or nearer upon very valuable land. Some prefer arms three feet long and a two tier trellis.

After the fruit is set, stop the growth of the canes at the third leaf above the upper cluster of fruit.

The cheapest and best way to make a trellis is by nailing light slats to light posts, with light upright wires between the slats at each cane. These wires should be galvanized. With tender sorts which it is desirable to lay down in winter, his process would be to incline a single arm at an angle of 45 degrees, and spur prune as in the double arm system. They can be readily laid down and covered in winter. We have thus, we think, been minute enough in our directions, and ample enough in our production of authorities, to enable even the beginner or novice to understand the best modes for planting, cultivating, pruning and managing his vineyard. And the experienced viniculturist will doubtless find our collection, condensation, comparison and digest of the many authorities on this subject, a matter of convenience and interest to them, even if any original suggestions we may have made should fail to impress them with new ideas. There are many systems of fancy *pruning* and training, which may do very well in gardens and small vineyards, but are too expensive for large ones. The Thomery system is one of the prettiest, perhaps, of any regular plan that has been proposed. But it needs cuts to illustrate it properly.

GRAPE HINTS FOR THE VINTAGER.

The Gardener's Monthly says: Grapes coming in bearing should not be permitted to perfect large crops of fruit while young. It is excusable to fruit a bunch or so on a

young vine, "just to test the kind," but no more should be permitted till the vine has age and strength. Vigorous growth, and great productiveness, are the antipodes of the vegetable world. Encourage as much foliage as possible on the vines, and aim to have as strong shoots at the base as at the top of the cane, this can be done by pinching out the points of the strong shoots after they have made a growth of five or six leaves. This will make the weak ones grow stronger. Young vines grow much faster over a twiggy branch, stuck in for support, than over a straight stick as a trellis, and generally do better every way. Where extra fine bunches of grapes are desired, pinch back the shoot bearing it about four or five inches above the bunch. This should not be done indiscriminately with all the bunches. Too much pinching and stopping injures the production of good wood for the next season.

These hints are for amateurs, who have a few vines in trellises; for large vineyard culture, though the same principles hold good, so far as they go, they will vary in their application.

William Saunders says he holds two undeniable facts in grape culture: 1st, that the best fruit is produced on the strongest and best ripened shoots; and 2d, that the shoots produced from spurs never mature so thoroughly as those produced from terminal buds. Farther, that properly ripened fruit will never be produced from unripened wood. Fruit apparently well colored may be seen on green growths, but such fruit does not possess the characteristics of a well-ripened bunch of grapes.

Save your Cuttings. It is scarcely necessary to remind the vintager that he will find it to his interest to save all the cuttings of choice varieties which may be cut from his vines at trimming time. They will, in many cases, more

than pay for the expense of pruning, as the best European varieties are still scarce, and will be, doubtless, for some years to come; and they sell at remunerative prices.

PART VIII.

BEST VARIETIES OF GRAPES FOR A VINEYARD.

1. For California. 2. For the States East and California. Importance of choosing the best varieties of grape for a Vineyard; all foreign varieties succeed in California. Lists of the choicest varieties of European grapes described and recommended for adoption in California. The chief varieties classified, with their various synonyms. Class 1. Describing the choicest varieties of foreign grapes of a white and yellow color; Malaga grapes, &c. Class 2. Those of a reddish, rose color, or striped. Class 3. Black or dark purple. Class 4. California varieties; native varieties adapted to the States East and to California.

I. For California.

It matters not how fine a climate the viniculturist may have, how good his soil, or site, nor how well his vineyard is planted and cultivated, if he have not the choicest varieties to start with, all his labor, care and expenditures will be lost, or comparatively so; nor should he take up a catalogue and make his selections at random, even from the best varieties in the list; for grapes that are good in one locality and clime, may be worthless in another. He should study and thoroughly understand his own climate and the properties of his soil, and see how they compare with those of the country whence comes the variety of grape which he wishes to adopt, and see that they correspond. And then, again, he must decide whether his vineyard is to be devoted to the growth of the vine grape or the table

grape, or for producing raisins; or whether for one, or all of these, together. We know this is a most difficult task, under ordinary circumstances; and especially so in California, where so little time has elapsed since the first introduction of the choicest European varieties. But we shall endeavor to render such aid as we may be able to do, with the best practical experiences of the day, and the most intelligent authorities at hand. We do not expect to be able to give lists that shall be infallible, or that will apply universally; for a grape that will produce good wine, and be an excellent table grape in the Sacramento and San Joaquin Valleys may not be thus in Los Angeles, or Sonoma or Napa even. But using the best lights of experience and observation that we have at command, we will proceed with our lists. It cannot be supposed that we shall be able to designate, definitely, what particular kind of grape is best suited to *all* localities in California; we can only give the kinds best suited to the State generally; and this, with the several districts best adapted for the particular kinds of vines, which will be found under the general heading of "Location, Site, etc.," for a vineyard, must be accepted as the best we have to offer. Nor can we, in all cases, designate, with accuracy, what varieties of grapes will be best for wine, and what best for the table, although we believe it will be found, generally, that almost all kinds of grapes grown in California, will produce wines of a quality more or less good.

Of the many hundreds of different varieties of grapes produced in different parts of the world, we do not suppose that there is an average of ten out of an hundred that are worth cultivating at all. Mr. Fuller, an Eastern viniculturist, says, that out of one hundred varieties of native grapes, he can name but *three* that he can recommend as

certainly valuable for every body to grow. These are, he says, the Concord, Hartford, Prolific and Delaware. Hence the importance of great care in selecting varieties to start with. Mr. Wilson Flint very truly says:

At the outset of planting a vineyard it is of the utmost importance to plant the most valuable kinds of grapes, as the difference in the cost of plants will, in any event, be trifling, while the after value of a vineyard, when in full bearing, will be double or quadruple, if not more.

Mr. Clement Detten, in a prize essay, from which we have already gathered many useful facts, gives the following list as the

BEST KINDS OF GRAPES FOR CALIFORNIA.

The California (Los Angeles), except that it ripens rather late in the season, I consider one of the best varieties for cultivation in this State, for the following reasons:

1st. This vine grows better without irrigation than any European variety.

2d. It is less liable to mildew, and when affected, more easily cured.

3d. It makes a fine-bodied wine, which will keep.

I think the California grape is disliked because we have so many of them, but feel assured that in a few years the public will have a different opinion of it. Of foreign varieties, I would recommend for cultivation in this State, of the kinds cultivated in the Eastern States, the Catawba and Isabella, neither, according to my observation, which, however, has been limited, being liable to mildew. Of

European varieties, those which I consider most deserving of cultivation are:

1st. The Black Hamburg, as one of the finest table grapes, and very good for mixing with other grapes in the manufacture of wine.

2d. The Black July, as an early table wine.

3d. The White Frontignac, as an early wine.

4th. The Muscat of Alexandria, as a table grape, and for preserving in jars.

5th. The Grizzly Frontignac, for table use and for wine.

6th. The Chasselas de Fontainebleau, as a table grape and for wine.

7th. The Traminer (*Fromentean*), as a wine grape.

8th. The Black Frontignac, as a wine grape.

9th. The Black Prince, as a fine table grape.

10th. The Dutch Sweetwater, not a table grape, but very good for wine; very tender, however, and liable to be affected by mildew.

11th. The Black Burgundy (*Pineau noir*), as a good table grape, and excellent for wine.

We doubt the remark of Mr. Detten, that the Mission grape is less liable to mildew than foreign varieties that have been introduced into California, is borne out by practical experience.

We have heard of no complaints, during the past two or three years, of any damage to the foreign varieties in this State, from mildew, or any other disease, unless, perhaps, in some isolated cases, where the vines were planted on rich *adobe* or bottom lands; and, in such cases, we doubt if the European grapes would suffer any more severely than our native grapes, under similar circumstances. We have already spoken of the vineyard of Mr. Miller, of Pleasant Valley, Solano County, who, some years since,

engrafted the best and most delicate varieties of the foreign grape upon his Mission grape stocks, with the utmost success, and that, too, while his vineyard is planted on valley land: nor do we think he has ever been troubled with mildew. And yet, in answer to our question, Mr. M. frankly admitted that he thought it a mistake to do away entirely with the Mission or native grape of California.

Mr. Flint has the following practical remarks on this subject:—Every vintner should thoroughly canvass, before embarking in the business, as to which are the best kinds of grapes for wine. The Spanish Mission grape, which has already borne the test of eighty years of culture in the State, without one recorded season of failure, still maintains its prominence, both as a dessert and wine grape. Indeed, by reason of its richness in grape sugar, the abundance of its juice, the evenness of its time of ripening, and the ample broad, thick foliage which enables it to withstand our dry, hot days, and during the succeeding cool nights absorb from the atmosphere an ample supply of moisture to feed its prodigious loads of fruit, places this variety almost without a par for extensive vineyard cultivation. Experiments, however, with many European sorts, indicate that varieties may be obtained which will supersede the Mission grape, by reason of their possessing a higher aroma, which shall give to wines made from them that great desideratum, "bouquet." Among the foreign sorts which already give evidence of great promise, is the Black Burgundy wine grape of France. Samples of wine made from this grape, grown in a number of distinct localities, were pronounced exceedingly rich, and there is no longer any question but that California will produce the celebrated Burgundy wines of an excellence far superior to those grown in its native districts in France. In-

deed, for young wines, the samples of Burgundy shown at the State Fair were remarkable for their color, body, and delicacy of flavor.

On the subject of the Catawba grape, Mr. Flint remarks:—Among the wines on exhibition were also found the famous Catawba of America. It may seem superfluous to speak in commendation of the Catawba grape as a wine grape, but when its wine has already obtained a world-wide reputation, and this reputation may justly be increased rather than lessened by the improvement in the quality of this grape in our favorable climate, it becomes a matter of the highest importance to our vintners to inquire as to the policy of making it a leading feature in California vine culture. A few reasons in favor of planting the Catawba grape, for wine purposes, may be briefly stated. Catawba wine has already obtained a lasting popularity. This grape will grow at a higher altitude in our mountains, and not suffer by frost, than any other wine grape. It also will flourish within the sweep of the cold ocean winds and fogs, unaffected by mildew. Finally, no other grape possesses so many elements for a wine of commerce, because its individuality of flavor is rather increased by age than lessened. It also will be an invaluable grape to mix with the Mission grape, to give the wines of the latter what they are most deficient in—bouquet and flavor.

Objections are made to this grape because it is not as prolific a bearer as the Mission grape; but when it becomes known that the Catawaba never fails to produce a crop in all situations and seasons, and besides, when wines shall have become cheap, it will then be an object to grow such kinds as will make a high-priced wine for the deficit in quantity, and be more than compensated by quality and

the lessened cost of labor in handling, cooperage and storage.

This commendation by Mr. Flint, of the Catawba, is pretty emphatic, and seems somewhat extravagant.

The list furnished by Mr. Detten is evidently incomplete in many respects. He does not name all the varieties, even, that have been tested and found to be a success in California; as, for instance, the Black Morocco, Rose of Peru, the Féhér Szagós or Zagós, the famous raisin grape, the Lombardy or Reine de Nice, etc. In fact, we believe all the choicest and most delicate varieties of the foreign grape will succeed in California. We propose, therefore, to give a full list of the most esteemed varieties of European grapes, so that the vinegrower can select for himself. For convenience of reference, we have divided them into three classes, classifying them according to color; the native varieties being under the head of Class Four. Where we are not familiar with a variety in the following lists, we have generally adopted Downing's descriptions, etc., as very reliable; also, in some cases, those of a work by W. C. Strong, lately published in Boston, and other reliable authorities.

Class 1.

Grapes with White or Yellow Fruit.

1. Bowker.

A seedling from a Malaga raisin, raised by Joel Bowker, of Salem, Mass., resembling the Lisbon grape, but superior. The bunch is large, closely set, with large, oval, white

berries of fair quality. It is very productive, and, according to Strong, equal in appearance to the White Hamburg. It has been tried with success in California.

2. Bowood Muscat.

An excellent new kind; shorter-jointed than the Muscat of Alexandria, having all its good qualities, and also the advantage of setting its fruit freely.

3. Cannon Hall Muscat.

A stronger variety than Muscat of Alexandria, both in growth and size of fruit. The berries are of the largest size, oval and white. This, also, succeeds well in California.

4. Charlesworth Tokay. *Thomp.*

Reputed to be of superior quality. Bunches long and compact; berries large, oval. Skin thick and white. Flavor rich and delicious, with a Muscat perfume.

5. Chasselas Musqué. *Thomp. Downing.*

Musk Chasselas: Le Cour.

Described as a very delicious grape, the highest flavored Chasselas, having much of the flavor of the Muscat of Alexandria. Description: bunches of medium size, long and rather loose; berries middle size, round; skin thin, yellowish white; flesh tender, with an abundant juice, of

a rich, musky flavor. Leaves smaller and deeper green than those of the Sweetwater or Muscadine.

6. Decon's Superb.

Bunches of good size and handsome; berries of a frosted amber color, and of good size. It is grown in California, to some extent, and considered a pretty fair grape.

7. Duchess of Buccleugh.

A new grape, said to be a cross between the Chasselas Musqué and a Muscat, and of the highest flavor; bunches large and long, tapering, slightly shouldered; is early, bears well, and does not crack.

8. Early White Malvasia. *Thomp. Downing.*

Morna Chasselas: Early Chasselas: Grove End Sweetwater: White Melier:

A fine early grape, and a good bearer, and is considered only an early variety of the Chasselas. Bunches, in size and form, similar to those of the White Chasselas or Royal Muscadine. Berries round, yellowish white; skin thin; flesh sweet, juicy and agreeable in flavor; ripens in August. Leaves pale green on the upper side, slightly downy below, cut into fine, rather deep lobes. We have seen fine samples of these in California; some from San José, raised, we presume, on rich valley land, were very juicy and of sub-acid flavor.

9. Foster's Seedling.

Exhibited in England in 1865, and described as having large bunches; berries medium, of a pale amber color; flesh juicy, luscious, and refreshing, equalling the flavor of Lady Downes, and, like it, hanging without shriveling.

10. Golden Hamburg.

A fine new white grape; bunches large and shouldered; berries large, oval; pale yellow; skin thin; flesh tender, rich vinous; very free and showy; ripening with, and a fine contrast to, the Black Hamburg.

11. Macready's Early.

Bunches of medium size, compact; berries white, transparent, oval, pointed; skin thin; very melting and juicy; a fine little grape.

12. Malaga Grapes.

MUSCATEL: LARGA: BLOOM: LOJA; PEROXIMEN.

People are in the habit of speaking of "*the* Malaga grape," as though there were only one prominent kind. There are at least fifty varieties, more or less esteemed; the Muscatel, Larga, or Bloom, Loja and Peroximen, are among the most highly prized; the first three for raisins, and the latter for wine; all good table grapes also. We have some of these varieties, more or less mixed up in this

country, under the various names of Muscats, Frontignans, &c. They will all do well in California. The *Larga* produces what is called the Bloom raisin; and we are of opinion that it is the same as that cultivated in this State by Mr. Bugbey and others, under the name of Féhér Szagós or Zagós; but we may be mistaken.

13. Marchioness of Hastings.

A new grape, now attracting much attention at the English exhibitions; of a greenish white color, the bunches being very large, weighing five pounds.

14. Pitmaston White Cluster.

A hardy grape, grown in England, from the Black Cluster, ripening somewhat earlier than the Sweetwater; of good quality.

Bunches of medium size, compact and shouldered; berries middle sized, round; skin thin, amber color, sometimes tinged with a little russet when fully ripe. Flesh tender, juicy, sweet and excellent.

15. Royal Muscadine. *Thomp. Lind. Mill. Downing.*

Amber Muscadine: Early White Teneriffe: Golden Chasselas: White Chasselas: Chasselas doré: Chasselas blanc: Chasselas de Fontainebleau: D'Arbois: Raisin de Champagne: Amiens.

This is the grape that Mr. Detten and others call the

Chasselas de Fontainebleau, which is only one of the synonyms of the Royal Muscadine, as will be seen above.

It is truly a fine grape, and succeeds well in California. We had some excellent specimens of this fruit sent us by Mr. Miller, of Pleasant Valley, on the 15th August. It ripens in California about 1st Aug.

Bunches large and well shouldered; berries round, and nearly as large as the Sweetwater; skin thin, at first greenish white, turning to a light amber color when ripe. Flesh tender, and of a rich delicious flavor. It ripens here nearly two months earlier than in the Eastern States.

16. Scotch White Cluster. *Thomp. Downing.*

Blacksmith's White Cluster.

We do not know as this has been grown to any extent in this country, but in England it has the reputation of being hardy, very early, and a great bearer.

Bunches of middle size, compact; berries of medium size, roundish oval; skin white, thin; flesh tender, juicy, sweet, and excellent.

17. Syrian. *Thomp. Lind. Speech. Downing.*

Jews.

This, says Downing, is believed to be the grape mentioned in the Scriptures, as found by the Israelites on the Brook of Eshcol, the bunches of which were so large as to

be borne on a staff by two men. It is a very superb looking fruit, and has been grown in this country to very large size. In England, bunches of it have been produced weighing 19½ pounds. It is not, however, considered equal in quality to the White Muscat of Alexandria.

Bunches enormously large, and regularly formed, with broad shoulders; berries large, oval; skin thick, white at first, but becoming a tawny yellow or amber, when at full maturity. Flesh firm and solid, moderately juicy and sweet, though not rich. The wood and foliage are very large. It will hang till Christmas in a vinery; it is grown to some extent in California. A specimen cluster of this variety, grown by Mr. M. R. Miller in his vineyard in Pleasant Valley, the past season, and sent to an Editor in Suisun, weighed near six pounds, and was of delicious flavor. Bunches of the Syrian have been produced in this country, we believe, measuring two feet in length, and weighing some 15 pounds.

18. Trebbiana.

This is one of the largest Exhibition grapes, the bunches frequently weighing eight pounds. It resembles the Syrian, but is distinct, and of better quality; berries, large, white, oval, firm, and keep well.

19. Verdelho. *Thomp. Lind. Downing.*

Verdal: Verdilhio: Madeira Wine Grape.

A vigorous growing grape from Madeira, which is

largely used in that island for making the best Madeira wines.

Bunches rather small, loose. Berries small, rather unequal in size, and often without seeds; skin thin, semi-transparent, yellowish green, a little tinged with russet when very ripe. Juice a little acid at first, but rich and excellent at maturity.

20. White Corinth.

A small white seedless grape, in compact clusters, of sweet and pleasant flavor. This is the grape from which the stoneless or Sultana raisins are produced. It originated in Greece, and is *supposed* to owe its seedless character to the circumstance of being produced from very *old* trees or vines.

21. White Frontignan. *Thomp. Downing.*

White Constantia: White Frontniac: Nepean's Constantia: Muscat Blanc: Raisin de Frontignan: Muscat Blanc de Juva: Moschata Bianca: Moscado Bianco: Moscatel Commun: Muscateller: Wiesser Muscateller: Weisse Muscaten Traube.

The White Frontignan, says Downing, is a very favorite grape, as the many names quoted above, by which it is known in various parts of Europe, sufficiently prove. Its hardy habit, uniform productiveness in the vinery, and most lucious flavor, make it every where esteemed.

Bunches of medium size, or pretty long, and without shoulders. Berries middle sized, round, rather thickly set,

skin thin, dull white or yellow, covered with a thin bloom. Flesh tender, with a rich, sugary, perfumed, musky flavor.

22. White Gascoigne.

Bunches large, compact, shouldered; berries large and oval; quality good.

23. White Hamburg. *Thomp. Downing.*

White Lisbon: White Portugal: White Raisin.

This is the grape of commerce, exported from Portugal, in such large quantities, to various parts of the world, put up in jars, boxes, etc. It resembles the White Malaga in many particulars.

Bunches large and loose, sometimes weighing three pounds; berries oval and large; skin thick, greenish white. Flesh solid, sweet, sometimes having a slight Muscat flavor. We believe this succeeds well in California.

24. White Muscat of Alexandria. *Thomp. Lind. Down.*

Frontinac of Alexandria: Jerusalem Muscat: Malaga: White Muscat: Tottenham Park Muscat: White Muscat of Lunel: Lunel: Muscat d'Alexandria: Passe-longue Musqué: Passe Musqué: Belbibo, (of Sicily.)

This is a most delicious, superb grape, and grows finely in California. The bunches are of a good size, weighing one, two, three, and sometimes five pounds, growing some-

what loose and irregular; berries large, oval, slightly oblong in form, in some instances nearly an inch in diameter; skin rather thick, light green color, approaching an amber, when fully ripe; flesh firm and crisp, with a rich, musky perfumed flavor, very delicious. Mr. Thompson considers this the same as the Malaga grape; and to us it has the appearance of being the same that we often met with in the Mediterranean, about Cadiz and Malaga and Gibraltar.

This is the kind of which we have spoken elsewhere, as having been raised by Mr. Miller of Solano County, who obtained from the fruit of two thousand vines, the third year from planting, $3,000. This year (1866) he had a very fine crop. They were ripe early in July, and are into market in November. Superb specimens of this same kind of fruit, were sent us from the vineyard of Messrs. S. W. and O. B. Shaw, of Sonoma; but they ripen several weeks later in Sonoma than in Pleasant Valley. The Shaws train their vines to stakes; Mr. Miller does not, but trims them in to short, round heads. The only objection we see to this grape is, that it has a somewhat hard pulp; but on this very account it will, we think, make a good *raisin* grape. Speaking of this grape, a committee of one of our State Fairs say: Any grape can be dried so as to give it the character, in outward appearance, of the raisin of commerce; but it is not every grape that will cure so as to be even an approach to the Malaga raisin. The only grape which has as yet been dried in this State so as to become a raisin at all resembling the Malaga raisin, is the White Muscat of Alexandria. This grape, after being dried, has the same color and soft pulpy body and rich aromatic flavor which so eminently distinguish the raisins of Malaga. It is true, that any kind of grape, when dried, will be valuable for cooking purposes; but soft-fleshed

grapes shrivel away to such an extent that when properly cured there is little left of them but skin and bones. On soft-fleshed grapes from one-third to three-quarters of their weight shrinks away under the process of curing, while of hard-fleshed kinds the loss of weight is only from one-third to one-half. In these remarks, the committee seem to ignore the Féhér Szagós, the raisin grape so successfully cultivated by Mr. Bugbey, of Sacramento; or perhaps they consider it the same as W. M. of Alexandria.

25. White Nice. *Thomp. McIntosh. Downing.*

A very large and showy fruit. McIntosh, a noted English gardener, has grown bunches of this fruit weighing eighteen pounds, and considers it one of the noblest of grapes.

Bunches very large, with loose shoulders. Berries roundish, medium size, thinly distributed over the shoulders and sides of the bunch. Skin thin, rather tough, greenish white, becoming at maturity a little yellowish. Flesh crisp, sweet, and of very good flavor. Leaves and wood very strong, the former very downy beneath.

Some authorities say that the White Nice is the same as the Royal Muscadine or Chasselas de Fontainebleau; but Downing makes it a different variety.

26. White Rissling. *Thomp. Downing.*

Schloss Johannisberg: Rudeshimerberg: Reissling: Petit Reissling: Grosser Riessling: Rössling: Kleir Rissling.

Speaking of this grape, a recent writer from Frankfort-

on-the-Main, says: From the Rissling variety are made those wines so celebrated and well-known throughout the world as Johannisberg, Steinberger, Catinet, Raunthaler, Berg, Leibfraumilch and Marcobeuner. The Rissling never produces in quantity as much juice as any of the other varieties, but it brings a larger price. These celebrated Hock vineyards, the same writer asserts, do not contain, all told, more than 75 or 80 acres. The usual product from this would be about 900,000 bottles, out of the *millions* sold in the United States under that name.

The bunches of this grape are of medium size, compact. Berries rather small, round; thin skin; flesh tender and juicy, with sweet and sprightly pleasant flavor. A variety called the Franklin Reissling has been grown in Santa Cruz County in this State, from cuttings obtained by Mr. Stock of San José, from Germany; from which an excellent article of white wine has been made the past year, by Mr. Feely, a vine-grower of Santa Cruz County.—So says the Santa Cruz Sentinel.

27. White Sweetwater. *Thomp. Downing.*

Early White Muscadine: White Muscadine: Early Sweetwater: Stillward's Sweetwater: White Chasselas: Chasselas de Fontainebleau: Dutch Sweetwater: Chasselas Précoce: Chasselas Royal: Water Zoete Blanc.

This variety succeeds well, and produces abundantly, in California. Bunches rather small size, very close, the berries pressing each other almost out of shape, but have rarely any imperfect ones as at the East; long for their diameter, and shouldered slightly. Berries of rather small size, round;

skin thin, clear watery green, with a slight tinge of amber when exposed to the sun, and fully ripe. Flesh juicy, sweet and of a very good flavor. Ripens in California from early in July to late in October.

28. White Tokay. *Thomp. Downing.*

Genuine Tokay: Gray Tokay: Tokaiblanc.

This is the grape out of which the noted Tokay wine of Hungary is made. It has a good flavor, and a peculiarly agreeable aroma.

Bunches of medium size, and compact; berries rounded, oval, closely set; skin thin, of a dull white; flesh very delicate, sweet and perfumed; leaves five-lobed, covered with a satiny down on the lower surface. This grape does well in California, and should be in every wine vineyard in the State.

Féhér Szagós or Zagós.

Larga?

This fine grape, which has attracted no little attention as the grape from which several persons, among them Mr. Bugbey, of Sacramento County, have, during the past two or three years, produced such lucious specimens of *raisins*, does not seem to have any distinct genealogy, and no one seems to know how it originated. It so nearly resembles the White Muscat of Alexandria, and also the White Frontignan, and the Larga, that we are inclined to think it belongs to that family. Its characteristics and appearance, so far as we recollect (not having seen a fair specimen of the grape since the State Fair of 1865, and then to give it only a casual examination), are so much like the three varieties

named, that we scarcely feel justified in giving it a distinct classification. We think it is the same as the Larga, or Bloom Grape of Malaga, from which the famous and lucious Bloom Raisins of Malaga are produced. Szagós or Zagós may have have been confounded with Larga, the true name in Malaga; although its name seems to be Hungarian.

China Grapes: The Peiho, etc.

None of the grapes of China have, to our knowledge, been introduced into the United States, at least to any great extent. We have raised them, to a limited extent, in China, but there are none of a superior character, if we except some from the Gulf of *Pichili*, which we call the *Peiho grape*, that are excellent, large, white, and lucious, somewhat resembling the White Muscat. Those on the southern coast of China are white, purple and black, but small, and not of very superior flavor.

We have sent for cuttings of the Peiho grape.

Class 2.

Grapes with reddish, variegated rose-colored or striped berries.

1. Aleppo. *Thomp. Lind. Downing.*

Switzerland Grape: Striped Muscadine: Variegated Chasselas: Raisin Suisse: Raisin d'Aless: Chasselas panachè; Maurillan panachè: Maurillan noir panachè.

This is a very singular grape, the berries being mostly

striped with white and black, in distinct lines; sometimes half the bunch will be black, and half white. It bears very well, and is worth cultivating, to some extent, for its singularity. The foliage is also prettily striped in autumn. Bunches below medium size; berries about medium in size, roundish; skin thin; flesh juicy and of a rich and excellent flavor.

2. De Candolle.

A large, round, purple grape, sweet and of good quality; clusters large and showy; requires high temperature to ripen, which it has in California.

3. Grizzly Frontignan. *Thomp. Lind. Downing.*

Red Frontignan: Grizzly Frontignan: Red Constantia: Muscat Rouge: Muscat Gris: Muscado Rosso: Kummel Traube: Grauer Muscateller.

This grape, grown in a vinery, is said to be scarcely surpassed for its delicious flavor.

Bunches long, with narrow shoulders; berries round, of medium size and growing closer upon bunches than those of the White Frontignan. Skin thick, pale brown, blended with red and yellow. Flesh very juicy, rich, musky and high flavored. This, by some authorities, is considered the same as the Red Frontignan; but Lindley, with whom Mr. Downing accords, thinks it a distinct variety. It is, however, a choice kind, and early.

4. Muscat, Austrian.

Similar in appearance and flavor, but inferior to Grizzly Frontignan; bunches medium, very compact; berries oval, tawny, red; keeps well, but sometimes cracks.

5. Red Chasselas, *Thomp. Lind. Fors. Downing.*

Red Muscadine: Chasselas Rouge.

Resembles the White Chasselas, except that the berries are slightly colored with red. Sometimes, when over ripe, they become a dark red.

Bunches loose, not large; berries medium size, round; skin thin, at first pale green, but when exposed to the sun they become red; flesh tender, sweet and very good.

6. Red Lombardy — Lombardy — Reine de Nice — Flame-colored Tokay.

Wantage: Rhenish Red: Red Grape of Taurida.

This fine grape, called by Thompson, Lindley and A. J. Downing, the Lombardy, and known in California, both by the name of Reine de Nice and Flame-colored Tokay, grows splendidly in this State, and is a most superb grape.

It has very large tapering bunches, well shouldered, from ten to fifteen inches in length; berries very large and thickly set, roundish, conical form; skin thick, rich wine color, or flame-colored. Flesh firm, sweet, juicy, and a

sprightly fine flavor. Ripe, in California, in August, September, and October. It will, we think, make a good grape for raisins and wine, as well as a fine table grape.

7. Red Traminer.

This is one of the celebrated table and wine grapes of the Rhine; clusters small, compact; berries small, roundish; rose color; quality slightly sub-acid, pleasant and excellent. It somewhat resembles the Delaware, which is thought by some to have been a seedling from the Red Traminer. This grape, we think, is the Traminer discarded from the experimental gardens in Washington as not worthy of cultivation; in *that* locality, we suppose. It may still do well in California.

8. Rose Chasselas.

Described as a beautiful and good variety, resembling the Royal Muscadine, except in color, which is bright rose. Its bunches and berries are scarcely equal in size, but its beauty and flavor recommend it to every collection.

9. Rose of Peru.

This delicious grape we find no notice of, in any of our books. It has been cultivated quite generally in California, for several years past, and is quite a favorite in market, as a table grape, and we doubt not it will make a good grape for wine. It is believed to have been brought from Peru,

some years since, and it adapts itself to our soil and climate as well as any of our natives.

Bunches, large, loose, well shouldered, tapering rapidly to a point, having lateral or accessory branches, or sub-clusters growing out on either side. Berries medium size, sometimes as large, almost, as the Black Hamburg; skin thin, of a dark purple, almost black; flesh rich, juicy, a little tart, and of lucious flavor. Ripe in California in August, September, October, and November.

10. Yedo.

This new species from Japan, has been thus far but partially introduced into our country, at the East. It has not, that we are aware of, been introduced into California, as yet, to any extent. We have seen it in Japan, its native country, but did not there find it a very choice grape. It may be improved by culture in California, if not at the East. It seems to succeed well in England Bunches of medium size; berries brown, with thin skin; flavor excellent.

Class 3.

Grapes of Dark Purple Color or Black.

1. August Muscat.

Said to be very early. Berries small, oval, black, with a slight Muscat flavor, not of first quality.

2. Barbarossa.

Bunches of large size, often weighing six pounds, heavily shouldered, compact; berries large, roundish oval, black with a thick bloom; skin membranous; flesh greenish white, juicy and of fair quality; is rather shy in fruiting, but is a valuable late kind.

3. Black Alicante.

Bunches large; berries large, oval, black; sets well and keeps late.

4. Black Cluster. *Thomp.*

This is called Black Morillon by Lindsley, and by others the True Burgundy, Black Burgundy, and by other synonyms. It is the Burgundy grape so highly prized for wine, in France. The fruit is very sweet and excellent, and is a hardy variety.

Bunches small, compact; berries small, oval, black, with thin skin, often bursting from the pressure of the berries; flavor brisk, somewhat acid, until over-ripe. It is a productive variety.

5. Black Corinth.

A small round black grape, the Zante Currant of commerce.

6. Black Frontignan. *Thomp.*

This is known, also, as Muscat Noir, Purple Frontignan, Black Frontignac, Purple Constantia, and by other names. Came originally from France, where it has been largely cultivated for making the Muscadine or Frontignan wine.

Bunches long; berries of a medium size, round, quite black; skin thin; flavor musky and rich. A good bearer.

7. Black Hamburg. *Thomp. Lind. Speech. Downing.*

Warner's Black Hamburg: Purple Hamburg: Red Hamburg: Brown Hamburg: Dutch Hamburg: Victoria: Salisbury Violet: Hampton Court Vine: Valentine: Gibraltar: Frankendale.

This Black Hamburg we think the *ne plus ultra* of a grape for California; at least of black grapes; and will closely dispute the palm with the White Muscat of Alexandria, as being altogether the finest variety of foreign grape that has hitherto been introduced into this State.

The bunches are very long, from six to ten inches in length, very broad at the shoulders, tapering to a point gradually. Berries very large, round, slightly inclining to oval; skin rather thick, deep purple, very black at maturity; very sugary, juicy and rich. It is a superb grape for California, either for the table or for wine, and ripens here in July, August, September, October, and November. We have had fine specimens of these sent us from Sonoma and Pleasant Valley; and they are raised very generally, we believe, throughout the State. Mr. Feely, a vinegrower of Santa Cruz, in this State, is said to have produced from

his Black Hamburg vines five years old, twenty-five to thirty pounds per vine, the past year.

8. Black Lombardy. *Lind. Thomp. Downing.*

West's St. Peter's: Money's: Poonah: Raisin des Carmes: Raisin de Cuba.

Bunches large and long, with shoulders; berries large, roundish oval; skin thin, very black at maturity; flavor very rich and sugary; leaves rather small, turning purple as the fruit ripens; keeps late.

9. Black Morocco. *Thomp. Downing.*

Le Cœur: Black Muscadel: Ansell's Large Oval Black: Raisin d'Espagne.

A large, showy grape, ripening rather late. Downing says, of this grape, that the blossoms are a little imperfect, and require to be fertilized with those of the Black Hamburg, or some other hardy sort.

Bunches large; berries very large, oval; skin thick, dark reddish black; flavor tolerably sweet and rich.

We have seen some fair specimens of this grape, raised in the Sacramento Valley; but they do not succeed well in all parts of California; for instance, Mr. Shaw, of Sonoma, says: The Black Bishop and Black Morocco are the same. I have them, but would not sell them (the cuttings from them) without declaring them (what they are with me) of no account whatever.

In speaking of this statement of Mr. Shaw in our paper, the Rural Home Journal, we added the following note:

We saw samples of a grape called the Black Morocco, at the last State Fair, and also at Stockton; they appeared like a fine grape, and evidently do well in some other localities, if not in Sonoma. We have raised, in the Empire of Morocco, nearly all the varieties of the grape of that country, but do not recollect any of them that resembled, exactly, what are here called the Black Morocco. Besides, there are many kinds of black grapes in Morocco; so that we might as well say the Black Grape of America, as the Black Morocco.

On this subject we may add some further observations in another part of this work.

If the cost be a standard of value, the Black Morocco must be a very valuable grape; for, while our best Mission grapes are retailing in the San Francisco market for *five cents* per lb., and the best Black Hamburgs, Muscat of Alexandria, &c., for 15 to 20 cents per lb., the Black Morocco have been sold at 80 cents per lb., and scarce at that.

10. Black Muscat of Alexandria. *Thomp. Downing.*

Red Muscat of Alexandria: Red Frontinac of Jerusalem.

Bunches large and shouldered; berries large, oval; skin thick, of a reddish color, becoming black at maturity; flesh quite firm, with a rich musky flavor.

11. Black Muscadine. *Lind. Thomp. Downing.*

Black Chasselas: Chasselas Noir.

A pretty good black grape, but not equal to some other varieties.

Bunches of medium size, compact. Berries roundish oval; skin thick, black, overspread with a blue bloom· juice sweet, and of pretty good flavor.

12. Black Prince. *Lind. Thomp. Downing.*

Alicant: Black Spanish: Black Valentia: Black Portugal: Boston: Black Lisbon: Cambridge: Botanic Garden.

An excellent kind, highly esteemed, with large and long bunches, partially shouldered; berries large, rather thickly set, oval, black, covered with a thick blue bloom; rather thick skin; flavor sweet, juicy, excellent. It is an excellent table grape, and succeeds well in California.

13. Black Saint Peter's. *Thomp. Downing.*

Saint Peter's: Black Palestine: Oldaker's West's Saint Peter's.

A fine variety, with large long bunches, well shouldered, often weighing two or three pounds; berries large, oval, very black, covered with a fine bloom; quality excellent, sprightly sub-acid; late, and keeps well.

14. Black Sweetwater. *Thomp. Lind. Downing.*

Water Zoet Noir.

Bunches small, compact; berries small, round; skin thin; with a sweet and pleasant juice. A second rate, but rather hardy sort.

15. Black Tripoli. *Thomp. Downing.*

Black Grape from Tripoli.

It is described as an excellent grape, ripening late. Bunches of medium size, shouldered, rather loose; berries large, round, often slightly flattened; stones quite small; skin thin, purplish black, slightly covered with bloom; flesh tender, sweet, and of tolerably good flavor.

16. Early Black July. *Thomp. Lind. Downing.*

July Grape: Madeline: Madeline Noir: Raisin Précoce: Morillon Hâtif: De St. Jean: August Traube.

The earliest of grapes, and chiefly valued for the desert on that account. At the East it ripens the last of July, or early in August. The leaves are rather small, and light green above and beneath.

Bunches small and compact; berries small, quite round; skin thick, black, covered with a blue bloom; flavor moderately sweet, but not rich or perfumed.

17. Esperione. *Thomp. Lind. Downing.*

Turner's Black: Hardy Blue Windsor: Cumberland Lodge.

This is a hardy, luxuriant and prolific grape, growing well in the open air; clusters very large, heavily

shouldered; berries small, black, with a fine bloom; sprightly sub-acid; of second quality.

18. Ingraham's Hardy Prolific.

A new grape which has obtained a first-class certificate from the English Royal Horticultural Society. Bunches a foot in length, with black, oval berries; vinous, with slight Muscat flavor.

19. Lady Downes.

Considered valuable as a late keeping grape. It some what resembles the St. Peter's, the bunches and berries being large, and the quality excellent. The fruit will remain plump and firm on the vine, if the frost is kept off until the new growth commences.

20. Miller's Burgundy. *Thomp. Lind. Speech. Downing.*

Miller Grape: Le Meunier: Morillon Taconné: Fro menté: Alcatica du Po: Sauvignien Noir:

A favorite variety, long known and cultivated in all parts of the world, as a hardy grape for wine and table use. It is readily known by the dense covering of *cotton down* which lines both sides of the leaves, whence the name *Miller's* grape.

Bunches short, thick and compact; berries roundish oval, very closely set together; skin thin, black, with a

blue bloom; flesh tender, abounding with a sweet, high flavored juice. Each berry contains two small seeds.

A valuable wine grape, as well as for dessert.

21. Trentham Black.

Bunches large; berries large, purple black; skin thin, earlier than Black Hamburg, and better than Black Prince, which it resembles.

22. Zinfindal.

Bunches generally almost equally divided into two long shoulders, making a large cluster; berries medium, round, very black, covered with a thick bloom; sprightly acid, becoming good when fully ripe. Makes a good wine grape in California.

Class 4.

California Varieties.

MISSION—LOS ANGELES—SONOMA—SANTA BARBARA—MAMMOTH—VITIS CALIFORNICA.

We have seen at the commencement of this Part of our subject, how great a favorite this Mission grape is in California. They are generally classed as two different kinds,

the Los Angeles and the Sonoma or Northern variety; but we doubt if they be of different varieties in reality. The difference of soil and climate may be sufficient to account for the slight difference in appearance of the fruit. They are supposed to have been introduced into California by the Jesuit missionaries from Spain, some eighty years since. They very much resemble a grape we have seen in Morocco, taken to that country we presume by the Moors, from Spain after the conquest.

The Los Angeles variety has a somewhat heavier bloom than that known as the Sonoma; but we have seen specimens from the San Joaquin Valley that had as heavy, deep a bloom as any we recollect to have seen from Los Angeles.

Bunches slightly shouldered, loose, divided in fact into many small, distinct, lateral clusters, from six to ten inches or more in length. We have seen bunches of this grape in the San Francisco market, the latter part of October, weighing severally 5 and 7 pounds. Berries medium size, round, purple-black, heavy bloom; exceeding sweet, juicy and delicious; skin thin, but seeds rather large. Ripens in favorable places, such, for instance, as at the Woolfskills', on Puta Creek, the first of July. It has succeeded very well in some of the Eastern States. Some cuttings from Los Angeles raised in the open air, in Albany, N. Y., are described as being not quite as large as those sent from California, but of fine flavor; the same, of a sample tried at Buffalo, N. Y.

Santa Barbara Mammoth Vine.

We call this the Mammoth, not so much on account of

the size of its fruit, as of its vine, and of its prodigiously prolific bearing properties. The following description is derived from the daily press of this city:

One of the celebrities of Spanish California is the immense and beautiful grape vine now growing at the Montecito, two or three miles below Santa Barbara. The planter of the vine was Dona Marcellina Feliz de Dominguez, of the earliest expedition to Sonora, before 1780. It was planted by her over sixty-five years ago, from a slip which she cut from the young vineyard at San Antonio Mission, in Monterey Co., for a horse-whip. Her husband had got permission to make a small garden near the warm springs of Montecito, and here she planted it on the edge of a knoll. It immediately took root and began to bud and leaf, and from careful attention, before she died, it was made to produce more than any known grape vine in all America, North or South. Between 1850 and 1860 it had been trailed over some 80 feet in circumference, with a trunk of 12 inches diameter, rising clean 15 feet from the ground. Some years it has borne over 6,000 bunches of ripe and sound grapes, or close on to 8,000 pounds, and become the wonder of every resident or sojourner in that part of California. And what is more, for the last thirty years it has principally maintained the old woman and her numerous family.

Prof. Silliman, when he visited it last year, said he had never heard of such an immense grape vine in any other country, which is saying a great deal, as he has travelled much in the south of Europe.

It may be well to add, that the *dona*, alluded to above, died a year or two since, having been not much less prolific than her noted vine, as she had brought forth fourteen

children who had multiplied in all to three hundred descendants.

We have thus given a somewhat extended descriptive list of the various foreign varieties of grapes which are considered of the choicest kinds, as well as our semi-foreign variety, the California Mission grape; and all of which, it is believed, are well adapted to the soil and climate of California.

One of the committees of our State Agricultural Fair, in their Report on the Culture of the Grape in California, speak thus, on this subject:

In this department of Pomology, localities are represented covering a great variety of soils, and extending over an area of territory greater than the wine districts of Europe, and your committee believe that on no other spot of the globe can there be found so many varieties of grapes, natives of such varying climes; all taking kindly to the new soil and atmosphere; each seeming to flourish better than in their indigenous homes. We find the hardy Isabella and Catawba, of frosty climes, growing side by side with the Syrian of the Holy Land, and the perfumed Muscat of Egypt; thus showing that in the amelioration of our climate each finds elements for the most perfect development. Speaking of Mr. J. R. Nickerson of Placer County, the committee add: This gentleman shows *fifty* varieties, all very fine. Among his lot are *fifty bunches* of Black Hamburgs, *grown on a vine one year old from the cutting.* [This is rather a big story, we admit].

The committee find that the California variety *mildews* in localities where many foreign kinds escape; and they come to the conclusion that it is safer to plant Black Hamburgs, Catawbas, Chasselas de Fontainebleau (?), White

Sweetwater, Royal Muscadine, and many other hardy foreign sorts, where there is any danger of mildew. Many foreign kinds also ripen earlier than the California variety, and come into bearing sooner, and it is believed will make a better wine. In conclusion, the committee suggest that the general exhibit of grapes establishes the fact that our climate can produce all of the finest varieties of grapes in out-door field-culture in as great perfection as under the most expensive hot-house care in the Atlantic States, or Europe, and that the choicest vintage of the world is yet to be produced in our favored land.

Mr. S. Rich, of Sacramento County, also exhibited twenty varieties of foreign grapes, among which was Reine de Nice, or Lombardy.

This was several years ago; since that time the culture of the foreign varieties of grapes has greatly increased in California.

At the late State Fair at Sacramento for 1866, there was a splendid exhibit of these foreign varieties of grapes.

Mr. B. N. Bugbey, who has two or three vineyards near Folsom, one the Natoma Vineyard, of about fifty-six acres, and the Duroc, of twenty acres, exhibited some forty kinds of grapes, many of them of the best European varieties; and some twenty varieties of wines, red, white and sparkling, from the most approved varieties of the wine grape; also, several samples of luscious raisins, some of the last year's make, produced from the Féhér Szagós or Sagós grape, *said* to be a native of Hungary; and the White Malaga, which resembles it. *We* have elsewhere expressed the opinion that this is the Larga, or Bloom Raisin grape of Malaga. Mr. B. produced last year 600 boxes of these delicious raisins, samples of which we have tasted, and

think them equal to the best Malaga raisins. He has, we understand, put up 1,000 boxes the past year.

Mr. J. R. Nickerson, also, (of whom we have spoken a page or two preceding this,) had a large exhibit of grapes from which he has made wine and raisins. His vineyards are in the foot-hills of Placer County. There were many other exhibitions of the foreign grapes, such as the Muscat, Hamburg, Rose of Peru, etc. The San Francisco market daily, during the latter part of summer, and through the autumn, presents exhibitions of these delicious fruits of the vine and of the choicest European varieties.

Vitis Californica, or California Wild Native Grape, has been introduced into the State of New York, in a small way, we presume, and is thus described by W. R. Prince, the well known fruit-grower of that State. Leaf sub-rotund, large toothed, entire or lobed, smooth above, tomentose beneath; berry small, black, moderately juicy, assimilates to V. cordifolia, but distinct, and ripens in summer. Vine of vigorous growth; usually found on the borders of streams. We have it bearing on our grounds. It is of most vigorous growth, and will ascend thirty or forty feet or more, and spread its branches in proportion.

Little or no account is made of this wild mustang here in California, while we have so many choice varieties that succeed so well.

II. American Native Varieties, or Grapes for the States East and for California.

We must now proceed with our list of grapes for the states east of the Rocky Mountains, as that is what we

mean by Eastern States. It is chiefly on our own hardy native varieties that our countrymen in those States must rely; as the inclemency of the winter climate, and the late and early frosts, put a most effectual embargo on the introduction of the choice tender foreign varieties that are so highly prized in the milder climes of Europe, and which flourish so preëminently in our own highly favored California. As all of our native, hardy American varieties flourish, also, equally well in California, in fact better than at the East, having their sharp, acrid properties and ascidity of taste very much toned down by our genial climate and friendly soil, our lists of those native varieties will therefore answer for California, equally as well as for our Eastern readers and viniculturists.

It cannot be expected that in this little Treatise we should be able to find space for *all* the native varieties that have sprung into existence during the brief history of our country; their name is legion, and legion upon legion. We have before us a list comprising over 300 kinds. We can only give the most select varieties, from the best authorities and lights of experience we have before us. And as there are many conflicting personal opinions engendered, to some extent, by the private interest and prejudices of parties directly and personally interested, we prefer to adopt the selections adopted by the most intelligent Associations which have made this matter a study and have informed themselves by practical experience. In accordance with this plan, we give first, below, the list selected by the Western New York Fruit Growers' Association, by a vote on each several variety, which will tend to show the popular opinion and experience of that intelligent body of Pomologists. At their meeting during the past summer, at Rochester, New York, on a proposition

to designate the best six varieties of grapes for general cultivation, the vote as to their relative merits stood thus:

Delaware	56 votes	Allen's Hybrid	9 votes
Diana	47 "	Adirondac	7 "
Iona	36 "	Clinton	7 "
Isabella	32 "	Rogers' No. 4	2 "
Crevelling	30 "	Clover Street Black	1 "
Concord	29 "	Hamburg	1 "
Hartford Prolific	25 "	Anna	1 "
Rebecca	10 "	Maxatawny	1 "
Catawba	12 "	Rogers' Nos. 3, 15, and 19	1 "

It will thus be seen, that the old favorites which so long ruled the day, Isabella, Catawba, and Clinton, are thrown quite in the shade by this expression of popular preference, and by the pretensious rivals that have assumed their place. This convocation of fruit growers we believe was made up of delegates or representatives from several other States besides New York; including, we think, Ohio, Pennsylvania, etc. Among the names of the gentlemen who took part in the discussion and action of the Association, as we recollect, were those of Downing and Barry, and Griffith, a prominent vine grower on the lake Erie borders of Pennsylvania.

We think, therefore, that this selection of the new hardy varieties of our native grape may be considered as the most approved, especially for the middle and northern States of the Union. And yet Mr. Barry, in the account of his late visit to the Lake Shore vineyards of Pennsylvania, Ohio, etc., says that the Catawba is the principal variety in all the bearing vineyards, but adds that other varieties are being tested, some of the new sorts quite extensively.

But, as we have shown, in a country so varied in soil, climate, and atmospheric peculiarities, as is our widely extended domain, a great variety and diversity of kinds must be required to supply the proper grape to the proper place. This part of our subject has already been discussed in Part II. of this work, under the head of Climate Best Adapted to the Culture of the Vine, showing the various divisions or districts where certain varieties flourish best.

A writer in the Magazine of Horticulture says that *Norton's Virginia* now stands at the head of grapes for red wine in this country; the must often weighing over 100, and its alcohol ranging from nine to eleven per cent. It colors early, but to make the best wine from it, the fruit should be permitted to hang until November.

It might, perhaps, be well to try this as a wine grape in California.

E. K. Phœnix, in the Country Gentleman, says: *Delaware*, *Concord*, *Hartford*, *Prolific* and *Crevelling* promise to be our staples.

And thus we might go on, almost *ad infinitum*, giving the encomiums of the friends of each variety.

We have, as we have before remarked, now before us a list of over three hundred varieties of native grapes, every one of which has doubtless some especial admirer and eulogist. But we must be content to present to our readers such a list as we think may be best suited for the various grape growing regions of our country; premising that we doubt not *all* will, more or less successfully, adapt themselves to California. Which of the untried varieties will succeed best will have to be demonstrated by actual experience.

We give, therefore, the following as our

DESCRIPTIVE LIST OF HARDY VARIETIES OF NATIVE GRAPES FOR GENERAL CULTURE.

1. Adirondac.

Presumed to be a seedling from the Isabella, which it resembles. Bunches large, compact, shouldered; berries large, round, dark with a slight bloom; skin thin; flesh melting, sweet, excellent, juicy, but not high flavored.

2. Allen's Hybrid.

Bunches large, long, compact, shouldered; berries medium, round, pale amber; skin thin; flesh melting to the centre; very sweet and juicy; not so hardy as some, but would do well in California.

3. Anna.

Bunches large, shouldered; berries large, globular; color white; flavor sweet, rich; ripens with Diana. It is vigorous and hardy; ripens two weeks earlier than the Catawba; is a fine raisin grape.

4. Bullitt. (Taylor.)

Originated in Kentucky; clusters and berries very small; greenish or brownish white; sweet and spicy; very hardy and strong. It makes a fine wine.

5. Catawba.

Bunches medium size, shouldered; berries large, round, pale red; sweet, foxy flavor. Succeeds well in California. It originated in North Carolina.

6. Clinton.

Bunches medium size, compact; berries small, round, black, acid; very hardy and a good wine grape.

7. Clover Street Black.

Originated by Jacob Moore, of Rochester, N. Y.; said to be a cross between the Diana and Black Hamburg. Bunches large and well shouldered; berries large, black, with a fine bloom; flesh tender with little pulp, sweet spirited and excellent; ripens middle September; a new variety that promises well.

8. Concord.

Bunches large, shouldered; berries large, round, black; sweet, foxy. Ripens in California in September.

9. Crevelling.

Berries large, round, black; sweet; bunches medium size, long and loose; skin thin; flesh melting, sweet, juicy, with a peculiar plum-like flavor; ripens with the Delaware.

10. Delaware.

Bunches medium size, compact; berries small, round; pale red; sweet, vinous. Originated in New Jersey; supposed to be a seedling from the Catawba, crossed with some foreign variety. Ripens middle of September in vicinity of Boston. Very good raisins are said to have been made from this grape in the Eastern States.

11. Diana.

Bunches medium, shouldered; berries large, round, reddish lilac; sweet, vinous. Takes its name from Mrs. Diana Crehore, of Boston, who originated it. This grape will produce good raisins.

12. Diana Hamburg.

Another hybrid, by Mr. Moore, of Rochester. It is thus described in Hovey's Magazine:

Clusters very large, six to eight inches in length, usually longer in proportion to breadth than the Hamburg; regularly shouldered, compact; berries roundish, larger than the Concord; dark crimson, with a rich purple bloom, mingled with a fiery lustre in the sunlight; flesh perfectly tender, breaking to the centre and letting out the seeds like a foreign grape; of sugary sweetness, in flavor remarkably like the Hamburg, but more aromatic and lively, fully equalling that excellent variety. Hardy and very productive; fruit ripens after the Concord, and a week or ten days earlier than the Diana. A promising new variety.

13. Hartford Prolific.

Bunches medium size, shouldered; berries medium size, round, black; sweet, foxy. Ripens in New York about first September.

14. Herbemont.

An immense grower, and the most ornamental of all outdoor vines; perfectly hardy south of New York; its berries medium size; color deep purple; covered with bloom; the bunches very large; has a very distinct rich spicy vinous flavor. Downing says of it: Its berries are *bags of wine.* A good variety for California, although it is somewhat uncertain in a cold climate.

15. Howell.

Of this new grape Meechan's Monthly says: It was perfectly ripe September 4; with bunches and berries of medium size, of a jet black color; thin skin, and too firm pulp; but superior to Concord, and much better than many that have been "let out" with a loud explosion.

16. Iona.

A promising seedling raised by Dr. Grant, supposed to be from the Catawba, which it resembles. Bunches large, shouldered, and rather loose; berries large, round, light red, with dark red veins; skin thin; flesh melting to the

centre; full of juice, brisk, vinous, and excellent. Ripens about with the Concord.

17. Isabella.

Bunches medium size, shouldered; berries large, oval, black; sweet, foxy, rich. Is a native of South Carolina, named after Mrs. Isabella Gibbs, of New York State, by whom it was introduced to the notice of cultivators. The bunches of the Isabella grown in California are very small; not much larger than those of the wild fox grape at the East; and the berries are but little larger than those. They are, however, much sweeter, and more juicy, here than at the East.

18. Israella.

Another seedling by Dr. Grant, resembling the Isabella. Bunches large, compact, shouldered; berries large, black, slightly oval, like the Isabella; skin thin; flesh melting to the centre; sweet, and free from foxiness; ripens early in September.

19. Louisa.

Dark purple; size and quality similar to Isabella; ripe ten days earlier.

20. Maxatawny.

Originated in Pennsylvania; is a healthy, early, vigorous variety, of excellent quality. Bunches medium, compact,

without shoulders; berries medium, oval, greenish white; flesh tender, sweet and delicious, without pulp. It is considered too late for northern culture; ripens at the East the first of October.

21. Minor's Seedling.

Clusters large; berries of medium size, pale, red, of fine flavor; productive and hardy.

22. Rebecca.

Bunches medium, compact; berries medium, obovate; greenish white; sweet, musky.

23. Rogers' Hybrids.

Of this large family of seedling, or hybrid grapes, brought before the public by Mr. E. S. Rogers, of Salem, Mass., Numbers 3, 4, 15, and 19, seem to be preferable. We will, therefore, give a description of those varieties:

No. 3.—Is considered one of the most desirable of this class, on account of its earliness, which is nearly with the Delaware. Bunches of medium size; berries above medium, oval, dark red; flesh tender, sweet, with flavor resembling the Diana.

No. 4.—A very large black grape, resembling the Union Village. It is of vigorous growth, hardy and productive; of good quality, noble appearance, and promises to be a

good market grape. Bunches large, compact; berries very large, round, black, with thick bloom; flesh melting, very juicy, sprightly acid, but becoming sweeter when fully ripe; later than the Concord.

No. 15.—Is regarded by Mr. Rogers as his best. It is remarkably vigorous, productive and hardy; and will pass as a good, sweet grape, where the taste is not too critical. Bunches of fair size, rather loose, shouldered; berries oval, large, dark red; flesh juicy, with some pulp and foxiness, and somewhat stringy; leaves a rough taste upon the palate; ripens as early as Concord.

Nos. 19 *and* 33, resemble No. 4, but are thought less desirable.

No. 41.—Is a large, black grape, similar to *No.* 4, and thought to be earlier and sweeter.

Mr. Strong says: The higher numbers of these seedlings are a second generation from the lower numbers, impregnated with foreign kinds; and, in general, they seem to have too much of the foreign element for our climate.

This objection, stated by Mr. S., will not apply to California.

24. Scuppernong.

This is a very distinct southern species of grape, growing wild from Virginia to Florida and Texas. There are several varieties, the white, blue, etc. Clusters small, loose, with but few scattering berries, sometimes not more than six. Berries large, round; skin thick, light green in the white, dark red in the black varieties; flesh quite juicy, except when very thoroughly ripe; juicy and sweet, but

with a strong musky scent and flavor; makes an excellent wine, but suited only to a southern climate; would do well in California, though probably not as profitable a variety as we already have in this State.

25. Union Village.

This variety originated with the Shakers, in a place of that name, near Cincinnati, Ohio, and was introduced by Mr. Longworth. In appearance it is described as like a monstrous Isabella, which it resembles in flavor, but is richer and ripens at least a week sooner. In bunch and berry it is said to be twice the size of that variety. It is a good *wine* grape.

26. Virginia Seedling. (Norton's Seedling.)

Originated in Virginia. It is considered a grape of rare excellence in Missouri, for the production of wine, and very hardy. Muench says, that during several years of almost entire failure of the Catawba grape crops, this vine bore regularly. He adds: It will hardly be supplanted in our own and in more southern latitudes, even by the best that may yet be found, since from it a dark red wine is made of very peculiar excellence, which, at the same time, in some of the diseases peculiar to this climate, is of the greatest service. The clusters bear small berries, very compact, dark and but little juicy; fourteen pounds yielding but one gallon of must; less suited for the table, but at full maturity, when they begin to dry on their stems, unusually rich in sugar and aroma. Is considered, altogether a superior grape for a mild climate.

The best six grapes for producing *wine*, in the neighborhood of Cincinnati, are deemed to be the following, rating in the order in which they are numbered, viz:

1. Delaware,
2. Herbemont,
3. Minor's Seedling,
4. Lincoln,
5. Catawba,
6. Union Village.

Mr. John L. Mottier, of Cincinnati, thus describes the wine he made from some of these vines:

The *Delaware* wine was the richest and preserved the real *bouquet* of the grape, and it improved by age. The vintage of 1859 contained 8½ per cent. of alcohol.

Herbemont.—The very uncertain climate of that region too cold for it. No good wine since 1850, until 1859, when the crop was good; wine very good; quite delicate; will not bear transporting to any great distance. Alcohol 5½ *per cent.*

Minor's Seedling.—Quite foxy in flavor, but a fine, light colored wine. Alcohol 6 *per cent.*

PART IX.

VINEYARDS OF MOROCCO AND SPAIN: COMPARED WITH CALIFORNIA. THE AUTHOR'S FIRST VINEYARD IN THE "LAND OF THE MOOR."

1. Grapes and Grape Culture in Morocco; the Author's observations and experience in that country; his First Vineyard; different varieties of grapes; The Black Morocco, the Red Morocco and the White Morocco; the Author's vineyard, and its picturesque aspect; climate of Morocco compared with California. 2. Vineyards of Andalusia; Raisins, and modes of preparing them; the Author's observations in Malaga, and during a horse-back tour through the *Vega* of Grenada, as related in his letter from Malaga; curing of Raisins no mystery or difficult process. Spanish modes of cultivating the vine, and the tools they use. 3. Dried grapes and Raisin making in California; the climate of California quite equal to that of Spain; the Author's reasons for that opinion. The bright Occident, and the flowery Orient.

1. Grapes and Grape Culture in Morocco.

From a communication written by us, under date "Land of the Moor, Tangier, Nov. 9, 1848," to the editor of the Albany Cultivator, and published in that periodical of February, 1849, we extract what we said therein on the subject of vine growing, the varieties of the grape cultivated in that country, and our "*First Vineyard in the Land of the Moor*" following:

Most of the tropical fruits grow here in perfection; the orange, lemon, lime, plantain, banana, fig, olive, date, etc.; and the grapes are delicious. There are many varieties of

this excellent fruit, some white, some black, and some of a wine color; the Muscatels are very fine; and there is a kind which, from their remarkable length, and delicate, slender, tapering form, I should call the "Ladies' Finger," that are of a rich, sweet flavor. We have had ripe grapes here since the middle of July. A single cluster which was sent me by a friend, weighed three pounds. This luxurious fruit may be bought here during nearly all of the summer months for one cent per pound. The hills and valleys for miles around this place, are covered with vineyards and orange groves; and most of my consular and diplomatic colleagues, have fine gardens filled with all these delightful fruits. * * * You will not be surprised, I presume, that amid such scenes, and under such tempting circumstances, my old horticultural mania should return. I have purchased of a Moor a little vineyard and garden, containing about an acre of ground, and which, although somewhat run down for want of proper care and attention in cultivating it, has, nevertheless, large varieties of grapes and figs, oranges, pomegranates, etc.

My little plantation is situated on the slope or terrace of a hill, a few rods outside of the city walls, (enclosed with a hedge of the ever-verdant cane, already fifteen to twenty feet high,) and commands fine views of the surrounding orange groves and vineyards, the mountain peaks of Morocco, (the grand old Atlas,) and the time-renowned "Pillars of Hercules," as well as of the old Moorish citadel, castle and upper portion of the town, and a delightful water view overlooking the Bay and Straits of Gibraltar, with the mountains of Andalusia and the rocky Fortress of Gibraltar, peering up in the gray distance; and all vessels going in or out of the Straits passing within range of our view."

Again, in a communication on the "*Fruits and Fruit Trees of Morocco*," bearing date "Tangier, July 4, 1850," and published in Downing's Horticulturist in October of that year, we wrote thus of

The Vine. The Grape grows here spontaneously, and is cultivated largely and successfully in the various gardens and vineyards which abound in the vicinity of the large towns and villages of the Empire, although comparatively little pains seem to have been taken to obtain the finer qualities, yet I have eaten of a number of varieties here that are little, if any, inferior to the best Malaga Muscatels or Blooms. Both of these superior kinds of grape are to be found here, as well as many other excellent varieties scarcely inferior to them in quality; in fact, I think that some of the smaller white grapes excel, in their rich musky flavor, and in melting juiciness, those far-famed and justly favorite varieties, although they are not so large and beautiful. Many of these choice varieties are, I doubt not, indigenous and peculiar to this country, but are without any appropriate name. Many of the black ones, although of a sweet, pleasant flavor, are too pulpy, and not so juicy and rich as the lighter colored ones. [Among these was what, in California, is now called the *Black Morocco.*] There are a few, however, of a wine color, long and tapering, (sometimes over an inch in length,) that are nearly if not quite equal in richness to the white. These we call the "Ladies' Fingers." [This is the *Lombardy*, or what is now called, in California, the *Reine de Nice*, and the *Flame-colored Tokay*, etc.]

We have ripe grapes here from about the first of July until late in October. Very little wine is made here, as the Moors are prohibited, by their religion, from making, vending, or using any kind of spirituous liquors. The Jews,

however, who are not allowed by their creed to drink any wine or spirits manufactured by Christians, make their own wine, which is but poor stuff; and also make a kind of liquor called *aguadiente*, upon which they contrive to make themselves merry, all "according to the laws of Moses," of course!

The vine flourishes upon nearly all kinds of soil. Many of the vineyards in this vicinity are upon pure, dry, light *sandbanks* which have been blown up from the sea shore. The leaves begin to fall in August, while the fruit is still ripening; and late in winter, before the vines start, they are trimmed, all the lateral shoots cut off, and nothing but the main branches left. Some of the more indolent of the natives turn in their calves, donkeys, etc., and let them browse off the superfluous branches, quite a labor-saving operation, as they think!

When the notes from which the foregoing extracts are taken, were made by us, in the "Land of the Moor," sixteen or eighteen years since, we little thought we should ever have occasion to use them in this far-off Golden State of the Pacific. But such are the mutations of human life. It has always been our aim in our travels around the world, to let no matters that might be of immediate or remote interest, escape our attention, or go unrecorded.

The climate and seasons of that portion of Northern Africa bordering on the Straits of Gibraltar and the Mediterranean, as well as the Southern coast of Andalusia, are similar to those of the milder portions of California, and as we are striving to introduce and acclimate the fruits of that region of country in California, it may be deemed a matter of such interest to our readers as to induce them to excuse this reference to our own by-gone experiences in that sunny land.

As a matter of further interest to the viniculturists and horticulturists of California, especially, we would state that we have sent out orders, some time since, for cuttings of the choicest varieties of the grapes and figs, (*such* figs we have seen in no other quarter of the globe,) and other choice fruits of Morocco, Malaga and Cadiz, as well as to Madeira, Lisbon, Oporto, Bordeaux, Marseilles, Smyrna, Alexandria in Egypt, Sicily, Manila, China, Japan, etc., and hope ere long to be able to show that California, the bright Occident, can vie with the flowery Orient, and the sunny lands of the Mediterranean, in the production of the choicest fruits of the earth, if she cannot rival the renowned and fabulous Garden of Hesperides.

2. Raisins. Modes of Preparing Them. The Author's Observations in Malaga.

We again find it necessary to recur to our notes of foreign travel to refresh our memory on the subject now before us. The production of Raisins is one of the most interesting and delightful, as well as profitable employments in which the viniculturist can engage, when he is fortunate enough to have a vineyard situated where the grapes that produce, and the climate that cures, this most delicious fruit, can be found. In *California* we have such a climate and can produce the required fruit in as great perfection as in any other country in the world. This is no extravagant declaration, but a simple, practical fact, as we think we shall be able to convince the reader of this little Treatise, by the time he has followed us through its pages.

In our travels through the *vega of Granada*, and the vine-clad hills of Malaga, (and as we travelled on horseback we had a fine opportunity of seeing the country,)

there was no object in nature, where man had had the fashioning, that impressed us with more novelty and interest than these same vine-clad hill-sides and teeming vineyards. And of all the vintager's operations none were more novel or interesting than the simple mode of transforming the rich, juicy grape into the delicious raisin. Of this process, let an extract from one of our own letters, written from that interesting region to a friend in New York, speak for itself:

MALAGA, *April* 25, 1850.

You have often partaken of Malaga raisins, the most delicious of all preserved fruits, and so have all our countrymen; but every one may not understand how they are prepared. The process is the most simple imaginable. As soon as the grapes begin to ripen, the vinedressers pass through the vineyard and cut the clusters off from the vines, and leave them upon the *naked ground*, turning them over daily, until the heat of the sun above, and the warmth of the earth upon which they lie, shall have baked and dried them through, when they are gathered up, put into boxes, and are ready for use. This is all the wonder and mystery there is in preserving and preparing this delicious fruit. To my inquiry, why they did not place leaves, or some clean dry substance of the kind, upon the ground, for the fruit to lie upon, I was told that the naked ground was much better; that, in fact, the fine flavor of the fruit was dependent more upon the warmth of the earth, than on the mere external heat of the sun. Care has to be taken, however, that the fruit does not get wet while undergoing this process. But as it seldom rains during the summer or vintage, in this country, it is very rarely that the fruit has to be taken up before it is fully dried. The vintage or season for gathering the fruit, commences

about the middle of August. Now (in April) the vine-dressers are busily engaged in hoeing and digging among the vines, clearing them of weeds, and hilling them up very much as the farmers in the United States hoe their corn, potatoes, etc. They use for the purpose, hoes somewhat resembling a pick, excepting that one side has two or three long prongs, with which they loosen the earth very effectively. The soil generally resembles a light and sandy loam, and does not appear capable of producing scarcely any vegetation. But the vine and the olive, you know, will flourish where almost every other kind of vegetable life would starve and perish. In all that part of the south of Spain through which I have travelled, from Cadiz and Tarifa to Malaga, Valez Malaga, Alhama, Granada, Logia, etc., this same barren, sterile appearance of soil is apparent upon the mountains and uplands. The general surface of the country is not merely undulating, but mountainous, to a far greater degree than I had any idea of. I do verily believe that these arid hills and mountains comprise nine-tenths of the whole surface of the land, in the province of Audalusia; and that the fertile spots—the vegas or valleys—only constitute the one-tenth. But these latter are the gardens of Spain.

These extracts will be sufficient to show, not only the simpler modes of curing and preparing raisins, but as well the climate and soils which produce the most delicious grapes, probably, and certainly the most luscious raisins of any country, where the experiments have been fully and fairly tried. And we repeat, that in climate and soil, and their affinity with the grape, there is no country that can claim to excel or equal it, so justly as can California. Spain has her Sierra Nevadas, snow-capped, her innumerable foot-hills, her valleys and her genial clime; California has all

these, her Sierra Nevadas, and foot-hills, as well; and has, thus far, shown that the vine and the choicer varieties of grapes, and richly flavored raisins, that she can produce, it will not be easy for far-famed Andalusia to excel.

Col. Haraszthy suggests that an improved drying ground for the raisin might be made, by using asphaltum, gravel, etc., in the manner of using it for sidewalks in our cities. One great objection to this mode is that the strong odor of the asphaltum would be likely, we think, to impregnate the fruit so strongly as to spoil it, unless there could be found some way to deodorize it.

But there are *other modes* of curing the raisin, differing somewhat from that given above, one of which we transcribe thus:

The raisins are sometimes dried on the vine, so as to preserve the beautiful bloom that covers the ripe grape. They are generally known as the Muscatel raisin. When preparing them, the grapes, when ripe, are allowed to remain on the vines, but the main stem of each bunch is cut partly off, leaving barely strength enough to prevent their falling to the ground, which shrivels them up, and dries out much of the original watery fluid; the leaves being properly removed to admit the sun, the pulp remaining, becomes, by concentration, very sweet. These are sometimes called "Raisins of the Sun." The Bloom and Muscatel or Malaga raisins, however, are the names by which they are generally known in this country.

The Sultana, or stoneless raisin, is made in a similar manner, from the White Corinth or Sultana grape.

The quantity of raisins imported into the United States from Spain, in 1849, was 24,448,630 pounds, valued at $1,420,980. More than twice or thrice that amount of money might every year be saved to our country, *and to*

California, by producing, as we are certainly soon destined to do, this fruit within our own borders.

3. Raisin Making in California.

Dried Grapes, which may perhaps be deemed an inferior kind of raisin, are often prepared in California, from the common Mission grape. The bunches when fully ripe, are plucked from the vines and hung up, in some sunny place, free from moisture, until partially dried, when they may be put under shelter, where they will still be kept dry ; and are thus preserved through the winter, and until the next vintage, with proper care. In the months of May and June last, while at Mr. Sathiel Wolfskill's on Putah Creek, we had some of these domestic raisins or dried grapes stewed for dessert, as our house-wives usually stew or prepare other dried fruits, such as plums, cherries, etc., and they were really delicious. They seemed equal to the dried Zante currants, such as are imported from the Levant. They should be hung up by the stems in single clusters, so far apart as not to interfere one with another. Some have suggested that they should be hung up in a reversed position, that is, with the stems downward, to admit of the air circulating freely among the berries. But in California, at least in the grape regions of the interior, there is so little humidity of the atmosphere, and the bunches of our grapes so loose, especially our Mission grape, that there is little need of a departure from the usual mode of hanging them up, as nature does it while on the vine.

Small slats fastened up overhead in any vacant room, or out-house, prepared for the purpose, with small wire hooks

on which to suspend the clusters, will perhaps be as good a plan as any. At Milton Wolfskill's we noticed these dried grapes were hanging in his wine cellar. But this was dry and airy.

The foregoing suggestions refer only to our Mission grape, or to those that will not make first quality raisins. Of course such grapes as will make a good quality of raisin, should be cured in the usual ways of preparing raisins, as we have described.

We know of no country, we repeat, where the climate is more favorable to the curing of the raisin, than California. The best raisins that are made in Europe are those produced in Malaga; and we have shown by our rain tables and thermometrical observations that California is even more favorable than Malaga, for the maturing of the grape and the curing of raisins. Of this fact we are also fully assured by the observations we made while sojourning for several years in that vicinity, on the African shores of the Mediterranean, where we kept regular meteorological tables, as well as from our observations while traveling in the south of Spain; Malaga, being upon the borders of the Mediterranean Sea, has a moister atmosphere than California, after you get beyond the coast range of mountains. In that country we have known of many occasions when there was a considerable fall of dew in the summer season. Back of the coast range, in California, there is no rain or dew or moisture during the whole period of maturing the grape and raisin, nor until past the vintage season.

We have heard it objected that some of the fine raisins produced by Mr. Bugbey were not sufficiently well-cured to keep any great length of time. That may be so; that is the fault of the vintager—not of the climate. They

should be left in the sun and open air until fully dried and cured, and then they will keep as long as any others. Mr. Bugbey has demonstrated that raisins of the first quality can be made in California; he uses for the purpose, thus far, we believe, a grape called the Fáhér Szagós, which is said by some to be a Hungarian variety, imported from that country, but which we have assumed to be the Larga of Malaga, although it may have been of Hungarian origin. We have elsewhere spoken more fully of the fine grapes and raisins of Mr. Bugbey, as exhibited at the State Fair of the California Agricultural Society.

PART X.

THE VINTAGE; GATHERING THE GRAPES; PACKING; MARKETING, ETC.

The Vintage; the "Harvest Home" of the Vintager; an interesting episode in his labors; should not gather his wine-grapes until fully ripe, or over-ripe; Col. Haraszthy's mode of gathering grapes; Mr. Muench's reasons for leaving the grapes on the vines to the latest practical period; grapes for market or table use may be gathered earlier; boxes for packing grapes for market; how they should be packed; how they gather and pack them at the East; citronized grapes; preserving grapes; paper pockets for pocketing the grapes.

Our vineyard being now in the process of maturing its fruit, the vines bending under the weight of their heavy clusters of luscious fruit, and presenting a most agreeable beauty to the eye and a delicious aroma to the taste, the vintager can well look with pride and satisfaction upon the work of his own hands, made fruitful and complete by the smiles of a beneficent Providence, who has furnished the rains and the genial suns, each in their season, and left to the husbandman the pleasant duty of gathering in the harvest—of making it truly a "*Harvest Home*" *jubilee.*

But the vintager must not be so eager to gather in the first fruits of the season, as to pluck them before they are fully ripe. For the table, or packing for immediate use, he need not wait for the fruit to become over-ripe; but for wine making, the longer the grapes remain on the vine the

better, so long as they are gathered in time to avoid the frosts or rains of autumn. In California there is no danger from frosts at all, nor from rains before the last of November, or fore part of December. And it is thought by some vintagers that the frost improves the quality of the wine. Col. Haraszthy says: No grapes ought to be gathered for making wine until they are ripe, and in fact, over-ripe. As long as they do not stick, when handled, to your fingers, like honey or syrup, they are not fit to make a generous wine. Some persons hurry on the vintage, in fear that the frost will hurt the crop. This is erroneous; the frost improves the ripened grapes, and makes the wine far superior to that of grapes gathered before the frost. The world renowned king of the wines, as the Tokay is called, is made in Hungary from grapes gathered very often under the snow, and never before a good frost has shriveled them.

This, we think, is of too extreme a latitude to allow of its being generally followed, as Col. H. has undoubtedly discovered, by the fact that he makes very good wine in regions of country where there is never any snow.

We think Col. H.'s mode of gathering the grapes is simple and expeditious. He says: One man with a basket can gather from one thousand five hundred to two thousand pounds of grapes a day in this country, if there is a cart close by to take the grapes to the press, provided the vines are summer pruned and not entangled. Persons having small vineyards will do well to gather their grapes in the morning, and not later than nine o'clock; for if gathered in the heat of the day, the fermentation will be too vehement, which is not good for making the best of wines; but when the vineyard is large, other remedies must be employed to prevent a too hasty fermentation.

Mr. Muench, the Missouri Viniculturist to whom we

have several times referred in this Work, gives the following reasons why grapes for wine making should be allowed to remain on the vines to the latest practicable period. He says: As the time for the grapes to ripen approaches, the acid in the grapes diminishes rapidly, and just as rapidly the saccharine matter increases. When the grapes, from their color, taste and softness, appear to be fully ripe, if one is not hurried up by the late season, and if there is no other considerable damage or loss to be apprehended, let the grapes hang for eight days more after maturing, by which the quality of the wine is often improved one hundred per cent. Grapes which are too watery, and it being not practicable to let them hang, may be somewhat more evaporated by being spread for a time on hurdles or straw in an airy place, or let them partly shrink, in a drying-house. Such wine will be heavier, but not more aromatic. In this way the dry wines are made. The grapes should not be harvested in rain or dew. The clusters are best cut off by scissors. The clusters, when gathered, should be carefully examined, and all decayed, green or dried berries removed. The transportation, where grapes are not very thin-skinned, can be made in baskets. Light water-proof wooden tubs are considered better. Where clusters ripen unevenly, as is often the case with the Catawba, the ripe and unripe should be kept separate.

In California we have no difficulty of this kind, as our grapes ripen so uniformly, that it is rarely that they will need assorting on that account.

The Buena Vista Vinicultural Society state the cost of picking and loading their grapes, in 1864, at a fraction less than $3 per 1,000 vines.

Grapes intended for table use, or for marketing, in boxes,

should, of course, be gathered before they become overripe.

Boxes for Packing Grapes.—Grapes brought into the San Francisco market, from the vineyards in this part of the State, are packed in boxes containing about fifty pounds. The process of packing is very simple. A large sheet of white or brown paper is laid into the bottom of the box, the grapes packed in close, another paper put over the top, the cover pressed down, nailed up, and sent off without further ceremony.

Those, however, coming from Los Angeles, and other distant places, are generally packed in dry saw-dust; as are, also, some that are repacked in San Francisco, to be sent some distance into the country. In this latter case, the size of the boxes varies according to the quantities desired to be sent.

In case saw-dust be used, it should be of a deodorized kind that will not injure the flavor of the grapes.

As showing the injurious effects upon the flavor of the grapes by packing them in saw-dust not entirely deodorized, we refer to a remark in the Transactions of the New York State Agricultural Society of 1864, where the Secretary, B. P. Johnson, Esq., in describing a box of grapes received from W. B. Osborn of Los Angles, says: The grapes arrived in safety, and were exceedingly fine in appearance, several of the clusters weighing 2 lbs. 2½ ounces. *Having been packed in redwood dust, the flavor was much affected, and the true flavor could not be determined.*

Modes of Packing Grapes at the East.—In an Eastern Agricultural paper we find the following mode of boxing grapes described. The boxes used in packing grapes for shipping are of different sizes, holding from five to twenty-

five pounds. They are sold, according to their capacity, usually at one cent a pound, a five pound box costing five cents, and so on for larger sizes. Establishments for their manufacture are found in all of the principal grape reigons. In packing, the top is first nailed on, and, the bottom being taken off, a sheet of thin white paper is put in. Whole bunches of grapes are first laid in, being packed as closely as possible without jamming them. The vacant places left, after putting in as many whole bunches as the box will contain, are filled with parts of bunches; and lastly, with single grapes; so that all the space is occupied. Another sheet of paper is now laid on, and the bottom nailed down. By this means, when the boxes are opened, only entire bunches are found at the top.

Citronized Grapes.—At a meeting of the Merrimac Horticultural Society, St. Louis, Mo., Mr. Haven exhibited a jar of citronized grapes, made of green grapes, a preserve that, while it is sweet, has an acid that makes it unusually agreeable to the taste of every one. We give the recipe for preparing it: Prepare clarified syrup by dissolving eight pounds of sugar with one quart of water, and then boil in this syrup eight pounds of green Catawba and Isabella grapes until they begin to shrink, when they should be opened on dishes to cool. Keep the syrup boiling, and when approaching the usual consistency of good syrup, replace the grapes, boil about ten minutes, when they will become fit for the jars and for use during the Summer and Fall months. If to be kept for years, it will be necessary to add a quarter of a pound of sugar. California grapes will, we presume, require no sugar.

To Preserve Grapes.—Pick when in blue bloom, fully ripe, in a dry, warm day; lay the clusters carefully in boxes

holding from 30 to 50 pounds, with layers of paper between each layer of grapes; cover, and put in a cool, dry cellar, and they will keep fresh until May.

Marketing. Grapes.—The question is often asked, says the Country Gentleman, why certain lucky vineyard men receive from 20 to 40 cents per pound for their entire crop, while others less favored are glad to accept 8, 10 or 12 cents? The answer must be, "Diligence is the mother of good luck." The best grape raisers, after they have selected the best sorts and the best soil, still give assiduous attention to three great points, viz: 1. Good and constant cultivation. 2. Careful and judicious pruning, and thinning out defective fruit. 3. Careful gathering and the most careful packing.

Among all the grape raisers of the State of New York, none, as far as we know, have been more successful than E. M. Bradley, of East Bloomfield, near Rochester. In answer to some inquiries, he has kindly furnished us the following statement of his management.

Permit me here to say that the *market value* of the grape is more dependent upon *judicious handling*, than that of any other fruit with which I am conversant. While the grape is a fruit peculiarly constituted to endure almost an unlimited amount of abuse in handling, yet no other fruit so richly pays every iota of care that may be expended upon it. The most casual observer of our great fruit markets cannot but have noticed the wide range of prices in all kinds of fruit, produced by a difference in method and style of handling. And no fruit with which I am acquainted, suffers more from neglect in growing and marketing, or more amply repays thorough husbandry, than the grape.

Thorough pulverization of the soil to a liberal depth

every week during the *growing season* of the vine, a systematic thinning of fruit, and shoving off all superfluous growth, will secure a well matured crop of grapes. As soon as fully ripe, (not before,) the fruit should be carefully picked, and laid in shallow, well ventilated drawers, carried to the packing house in a spring wagon, and placed in racks or cribs over registers so constructed as to afford plenty of fresh air, but not exposed to light, or artificial heat. Here the fruit may remain for months in safety, and retain its plumpness and bloom perfectly. When desirable to send to market, the drawers are taken from the rack in the store room, and placed upon the tables in the packing rooms, where the fruit is carefully assorted, all green berries and the superfluous stems removed, and packed closely in paper pockets or wooden boxes, and immediately shipped. The packing rooms should be well lighted.

Small paper pockets, containing from one to three pounds, snugly packed in wooden cases, two dozen pockets in a case, are found to carry the fruit more safely to market than larger packages. The cases should be as nearly air tight as possible. I have sent many tons, packed in this manner, to Charleston, S. C.; Nashville, Tenn.; Quincy, Bloomington and Dubuque, on the Mississippi River, and many other towns, over equally hazardous routes with entire safety.

Good grapes, neatly packed in fancy paper pockets, will always sell at remunerative prices, however much the market may be "*glutted*" with fruit put up in a slovenly manner.

These are the same kind of "paper pockets," we presume, that are used in San Francisco, by retail fruit dealers, for all kinds of small fruits, as well as grapes.

PART XI.

WINE-MAKING AND ITS INCIDENTALS.

Different modes of making wine; various kinds of apparatus and wine presses; Dr. Mottier's mode of wine making in Ohio; Mr. Longworth's ditto; wine making operations of the Buena Vista Vinicultural Society of Sonoma, California; what it costs; the produce per 1,000 vines; products of the vineyard; amount of wine made in the town of Sonoma, in 1865; number of vines, classifying wines; wine cellars; a new idea for wine growers; wine casks; a good suggestion.

THE modes of making wine are almost as various as are the opinions of those who engage in its preparation; we will not say *manufacture;* as wine should not be manufactured. It should be allowed to make itself. But it is, of course, necessary to give it a right start.

Various machines and processes have been invented for the purpose of crushing and expressing the juice. One of the latest inventions we have heard of is a crusher with India rubber covered cylinders, which crush the berry without breaking the seed, which is a desirable consideration. We have not seen the machine, but believe it was on exhibition at the late State Fair.

It is deemed unnecessary here to go into a minute description of the various machines used in the process of wine making; or to give the preference to one over another. Whenever the vintager is making his arrangements for a vineyard, and for wine making on a large scale, he will

find it to his interest to examine all the most improved kinds of apparatus, and choose for himself.

The following directions for making wine from the grape are given by Dr. J. E. Mottier of Cincinnati, Ohio.

In order to make good wine, it is necessary to have a good cellar, clean casks, press, etc. First of all, have your grapes well ripened; gather them in dry weather, and pick out carefully all the unripe berries, and all the dried and damaged ones; then mash and grind them with a mill, if you have a proper mill for the purpose. Be careful not to set your mill so close as to mash the seed, for they will give a bad taste to the wine. If you wish to have wine of a rose color, let the grapes remain in a large tub a few hours, before pressing. The longer time you leave the grapes without pressing, after they are mashed, the more color the wine will have. For pressing the grapes, any press will answer, provided it is kept clean and sweet.

After you have collected the must in a clean tub from the press, have it transferred into the cask in the cellar. Fill the cask within ten inches of the bung; then place one end of a siphon, made for that purpose, in the bung, and fix it air tight; the other end must be placed in a bucket containing cold water. The gas then passes off from the cask without the air coming in contact with the wine, which would destroy that fine grape flavor, which makes our Catawba so celebrated.

When properly made the must will undergo fermentation. Keep the end of the siphon that is in the water full four inches deep, so as to exclude the air from the wine. When it has fermented, which will be in fifteen days, fill the cask with the same kind of wine and bung it loosely for one week; then make it tight. Nothing more is needed till it is clear, which, if all is right, will be in January or

February next. Then, if perfectly clear, rack it off into another cask, and bung it up tightly till wanted. If the wine remains in the cask till Fall, about November, it will improve by racking again. Be sure to always have sweet, clean casks. Do not burn too much brimstone in the cask. I have seen much wine injured by excessive use of brimstone, generally by new beginners. For my part I make little use of it.

You can make different qualities of wine with the same grape, by separating the different runs of the same pressing. The first run is the finest, if you want to make use of it the first season; but it will not keep long without losing its fine qualities.

To make good, sound wine, that will improve by age, the plan is to mix all up together. The very last run will make it rough, but it will have better body and better flavor when two or three years old, and will improve for a number of years. The first run will not be good after two or three years.

I have fully tested the different ways of making and keeping wine these last twenty-five years.

The following on winemaking was written for Downing's Horticulturist, some years since, by the late N. Longworth of Cincinnati, Ohio, then the most experienced vintager in this country:

We gather our grapes at full maturity; carefully pick off all green, rotten and decayed grapes; pass them as speedily as possible through a machine, (thoroughly seasoned, and all possible taste from the wood extracted,) to separate the stems from the grapes, and mash them, without breaking the seed. Instead of placing them in a towel and bowl, we place them on a large clean press, in which not a nail is driven, and the wood of which has been fully seasoned;

and even if of beach wood, should not allow a particle of the taste of the wood to remain in it. Press it as speedily as possible, keeping the last hard pressing separate from the earlier runnings. Place the *must* in clean casks, from which no taste could be obtained from the wood, or any previous brandy or wine holdings, unless from liquor from the same kind of grape. We immediately place the cask in a cool cellar, do not fill it entirely, but as soon as the fermentation commences, stop the passage of the strength and aroma of the grape as far as possible, by putting in a tight bung, through which passes a crooked siphon into the cask to receive the air, and the opposite end of the crooked siphon is placed in a vessel of water; and the siphon is continued until the fermentation is nearly over, when the siphon is taken out and a tight bung driven in, giving air by a small gimlet hole two or three times a day, for three or four days; after which all air is excluded till the wine is clear, when it is racked, and the cask thereafter kept full and tight. If we wish a superior article, we do not deem it fit for bottling till four or five years old. If fining were necessary, and isinglass or the white of eggs, to fine a pipe, cost $20, we should never think of using beech chips.

Wine Making Operations of the Buena Vista Vinicultural Society of Sonoma, California.—The Buena Vista vineyards are believed to be the most extensive of any one establishment of the kind in this or any other country—the largest in the world. The following interesting statement of its operations has been furnished by the managers, whose reliability and general statements may be depended upon:

The property of the Society includes a body of land of over 6,000 acres, of which the vineyard occupies 645 acres. The number of vines planted is over a million (1,128,120).

At the last vintage about 103,800 of these were in bearing. These varied in age from one to thirty years—almost one-half of them only being of full bearing age. These latter stood in various parts of the 645 acres of vineyard land—the recent plantings having been for the most part made between the rows of old vines. So far as conditions of soil and aspect are concerned, therefore, the whole ground has been tested by the vintage of 1864.

The vines are managed under a system of extreme simplicity; no staking or training is required, and an extraordinary economy of labor in their cultivation is attained. They are planted in rows from three and a half to four and a half feet apart each way, and are cultivated by the Chinese laborers in the manner known as the flat way of cultivating Indian corn in the Eastern States. The soil being very friable, flat, and free from stones, both horse and hoeing are performed with great ease and rapidity; and the total expense of cultivation in 1864, was at the rate of but six dollars and three cents per acre, including the pruning of vines, and an allowance for superintendence, and the wear and tear of the implements used.

As the young vines grow to full bearing size they occupy more room, and hereafter a larger part of the cultivation will need to be by hand. The expense of cultivating the older and closer planted part of the vineyard does not appear in the accounts furnished us, distinctly from that of the whole. We think it safe to assume, however, that the expense of cultivation need never be more than four times as much for the whole vineyard as it was in 1864, in which case $24.47 per acre, which is at the rate of $14 per 1,000 vines, may be considered a maximum rate for the expenses of cultivation.

The picking of the grapes, and the loading of them in

wagons, cost, in 1864, a fraction less than a rate of $3 per 1,000 vines.

The following is a statement of the rate of production of 50,000 full-bearing vines, as nearly as it can be determined, in 1864—a year of extraordinary dryness and unproductiveness:

Production.	*Rate per* 1,000 *Vines—Gals.*
White Wine for Champagne	167
White Wine	333
Red Wine	160
Brandy	16

Of the bearing vines in 1864, only 16,000 were planted before 1858, and none of those since planted bore as fully at the last vintage as they may be expected to hereafter. The youngest plantation then produced, according to the Superintendent's estimate, but fourteen gallons of white wine per 100 vines, while those planted before 1858 produced fifty-seven gallons per 100, and those planted previous to 1855, eighty gallons per 100. In previous years the production of the latter has been larger; and it is believed that an average production of eighty-six gallons per 100 for mature vines of the Spanish or Old California variety, and seventy-one gallons per 100 for vines of varieties recently introduced from Europe (which forms about one-ninth of the vines planted), may be calculated on. An estimate of the future production of the vineyard, therefore, based upon the foregoing table of the yield of 50,000 of the older vines in 1864, must be regarded as moderate.

The whole expense of wine making, from the field to the cask stored in the cellar, was, in 1864, at the rate of $20 per 1,000 vines, or four cents per gallon of white wines produced—superintendence, interest on cost, wear and tear of casks and implements included.

The distillery expenses amount to a rate of ten cents per gallon of brandy produced, or for sixteen gallons, the production of 1,000 vines, $1.60.

The machinery being designed for the larger work that is expected to be required of it in the future, a reduction is expected to occur in the above stated rate of expenses of wine making equal to at least half a cent per gallon. It is possible, however, that unforeseen difficulties may occur in the management of the increased business; and we therefore adopt $20 per 1,000 vines as the established rate of expenses in wine making.

The buildings and machinery used in the process of wine and brandy making, are of substantial construction, and well adapted for the accomplishment of a large amount of work, with great economy of current expense. A steam engine of thirty-horse power is employed, and the wine at different stages of the process is put, by a force-pump, through hose and metallic pipes, the whole extent of which employed is 900 feet. The apparatus used is an improved arrangement of that recently adopted in the best French vineyards. The cost of the whole works, including the press-house, the distillery, and the cellar, with their equipments complete, has been $40,000.

We recapitulate as follows:

Maximum rate of Expenses per thousand Vines, close planted and full bearing, with a production of five hundred gallons of White Wine, one hundred and sixty of Red Wine, and sixteen of Brandy.

Vineyard expenses	$14 00
Housing the grapes	3 00
Wine making and cellarage	20 00
Distillery expenses	1 60
Total	$38 60

At the rate thus established, the annual expenses of the whole Vineyard of 1,000,000 vines now planted, when in full bearing condition, will be	$38,700 00
Add twenty per cent for contingences	7,740 00
Total for one million vines	$46,440 00

The total production of the vineyard in full bearing, at the rate previously determined, will be—

	Galls.
White Wine for Champagne	167,000
White Wine	333,000
Red Wine	160,000
Brandy	16,000

The California market is at present overstocked with new native wine of inferior quality. The better class of native light wines has never been put in the general market; they are unknown to the public; and from the present price of ordinary wines, nothing can be inferred as to their value when they shall have been introduced in large quantities, and their superior quality generally appreciated. For these reasons, it is impossible to form an estimate, with much confidence, of the value of the production of the vineyard. We are informed that some thousand gallons of the white wines of 1863 has been sold in New York at a price which leaves ninety-two cents as the net price of the wine in the cellar. At this price, the value of a vintage would be $500,000—a fair allowance being made for the red wine and brandy.

To establish a minimum, however, we estimate the value of the whole, *for Brandy*, as follows:

	Galls.	
449,800 gals. White Wine, reduced 6 to 1, is of Brandy,	74,966	
160,000 gals. Red Wine, reduced 6 to 1, is of Brandy...	26,666	
Total	101,632	
Add Brandy previously provided	10,666	
Total production in Brandy,	112,298	
Which, at the extremely low price of $1,50 a gal., is		$168,447
Deduct distillery expenses		10,163
Minimum value of vintage		$158,284
Deduct yearly expenses		49,440
Minimum net profit per annum		$108,844

Of the profit to be found in the manufacture of champagne, in which the officers of the Society have great confidence, and which has been commenced under the management of an experienced person, we have said nothing—preferring to confine our observations, as far as possible, to the facts of the business which has been established by actual experience.

That the whole expenses of wine making, from the field to the cask, stored in the cellar, should be but *four cents* per gallon, as set forth in the foregoing statement, has been doubted by some people, who have given the subject some consideration. But the facilities possessed by this Association, in consequence of their extensive business, and extent of machinery, may enable them to do it at the rates stated. They certainly ought to know best.

We believe that five cents a gallon will be a fair allowance for the expense, in ordinary cases. It is not supposed that every small vintager will be able, or will need go to the expense of extensive machinery, etc., for wine making. In

every neighborhood where there are vineyards of any great extent, there will doubtless be wine presses and all the necessary conveniences established for the purpose of taking in and manufacturing the grapes from the neighboring vineyards, either on shares, or for a certain price per gallon, or will purchase the grapes outright, and relieve the vintager of all further trouble or responsibility.

On the subject of the cost of manufacturing wines, Mr. Arpad Haraszthy assures us that himself and partner made 30,000 gallons one season for their neighbors in Sonoma, gathering the grapes from the vineyard, and putting them through every necessary process until made into good wine, for 8 cents per gallon, and they consider they made a profit of 100 per cent.

The *White Wines* of Sonoma are chiefly made from the Mission grape. The Royal Muscadine, and the White Rissling, are used to some extent, and make an excellent wine; *but* it is too shy a bearer in Sonoma, to be considered a profitable wine grape, *in that locality*.

The *Red Table Wines* are made from the Mission grape, also from the Zinfidel, the Black St. Peter's, and a grape called Chagres Heneling, of which we have no particular history.

The number of gallons of wine made in the town of Sonoma, in the season of 1865, is stated at 126,844; number of vines, 2,438,000. The amounts for the year just passed, will greatly exceed these figures.

Clarifying Wines.—On this subject the Rural American has the following: After grape must has undergone its great fermentation, and is barreled and stored away, a second or slow fermentation usually takes place, and is allowed to continue up to a certain point, which differs for different wines. As long as a particle of sugar remains,

and a particle of vegetable, fermentive matter, the secondary or slow fermentation may, under favoring circumstances, take place. To whatever extent it may have gone, the resulting wine is turbid, because of opaque vegetable matter left floating in the condition of minute shreds. This vegetable matter may deposit, if sufficient time be given, or it may not, the result being dependent upon the nature of the wine. If it deposit naturally, the addition of finings may be dispensed with, racking into another cask sufficing to achieve the desired object; if otherwise, some sort of finings must be used for this purpose, from time to time, such as white of egg, milk, gelatine, isinglass, etc. Whatever the clarifying material used in any particular case, the deposit should be allowed time to settle, and the clear wine racked off.

A New Idea for Wine Growers.—The Alta California, of a recent date, contained the translation of an article from the French, on which that paper comments thus: We publish this morning a communication containing a translation of an article in a French paper giving an account of an alleged discovery of great importance to wine growers. The discovery is, that wine heated to a temperature of 113° Fahrenheit will not turn sour when exposed to the air. It is well known that heat above 100° is less favorable to fermentation than 70°; but whether the influence on wine is so great as Mons. Pastuer asserts, may be doubted. It is a very easy matter, however, to try the experiment, by putting wine after it is bottled into water, and heating the water gradually up to 150°. Then let a corked bottle, half full of the wine which has been heated, stand for three days in a warm room, side by side with a bottle half full of similar wine, which has not been heated, and at the end of that time a comparison of the two wines will show the

influence of heating. M. Pastuer's idea is that the heating will have a preservative influence on wine after it has passed through the vinous fermentation; not that the quality of wine will be improved by heating, or that fermentation, either vinous or acetic, will be entirely prevented.

Wine Casks.—One of the most expensive items of wine making is that of casks for holding wine after it is made; it having been the custom to suppose that there was no material in California suitable to make them of; and it has been brought from the East, at great expense. We have been told by those who have made the trial here, that there is no difficulty in obtaining an abundance of material suitable for the purpose, in our own State. On this subject, the Daily Bulletin, of this city, has the following judicious, truthful and pertinent remarks, which we trust will be duly pondered and acted upon by those interested:

Wine Casks of Home Manufacture.—It is said that there is no little difficulty in procuring wine casks to hold the product of this year's vintage, especially in the southern part of the State. These casks cost, at present, from 15 cents to 20 cents per gallon, and are not readily procured at that price.

It is as easy to produce the wine casks from our own resources as it is to produce the grapes or the wine; and it is singular that there should be abundance on the one hand and scarcity on the other. For many years nearly all the staves for barrels were brought into the country under the mistaken impression that none could be produced here. And even now, large quantities of shooks are imported, which are not a whit better than those made at home. There are several sorts of oak growing in this country which make the best of staves. The white, free-

grained oak, the bark of which is used by tanners, is easily worked into staves, than which there are none better brought here. Besides, it has been ascertained by careful experiments that staves from redwood make excellent wine casks. The acid which it contains is easily separated by steaming, and by other processes both simple and effective. Oak staves require treatment of this sort to prevent staining and the "wood taste." Redwood timber at present is both cheap and abundant. It is easily worked, and resists decay better than any other timber grown in the State. Casks made of this timber are light, strong and tight, and when "steamed," no effect of taste or color is perceptible in the wine. Large vats, tanks and cisterns are made of this timber, and for all such uses there is nothing equal to it on the coast.

The manufacture of wine casks of all sizes is worthy of the attention of men of enterprise. Something has been done in this way already. But what is wanting is an establishment with all the requisite machinery, so that the business can be carried on with system and economy, and on such a scale that it would ensure the filling of large orders at short notice. Such an establishment would acquire a reputation for the excellence of its work, and its wares would control the market, as powder, leather, brooms, and other articles of home manufacture now do. At 5 to 7 cents per gallon for casks as they run, from a keg to a puncheon, and with no lack of orders, a manufactory of this kind ought to be successful. Besides, the same establishment having once its machinery set up and everything in order, could make every variety of cask, either of oak, redwood, or of any other material required. Cedar tubs and pails, now made here, and of the best quality, illustrate how easy a matter it might be to establish a pros-

perous business in the manufacture of wine casks of such a quality, and at such prices, as to leave nothing further to be desired in this respect by the wine growers. If, as has been stated, there are not enough of barrels and pipes in the State to hold the wine that might be produced this year, it is certain that there is a clear field for the branch of business suggested, on a large scale. And the sooner we are able to supply our own wants in this particular the better.

We repeat the hope that the foregoing suggestions, and the subject on which it treats, will receive the attention their importance deserves.

Wine intended to be kept any considerable length of time, should be put into wooden vessels, or casks, then it will improve by age to an extent that it will not, if kept in bottles.

Wine Cellars.—From the Transactions of the Illinois State Horticultural Society, the annexed directions on the subject of suitable wine cellars is obtained: The wine cellar is very important, as without a good cellar you cannot expect to keep your wine. It should be dry enough below the ground to keep an even temperature in summer and winter. It is generally made in the north side of a hill, and arched over; say twelve feet deep, so that the door is even with the ground, with abundant ventillation to keep it dry. The casks are laid on wooden frames, leaving abundant room to get between the two rows, and about three feet from the ground. They are then filled with the must, preferring the *under* fermentation; that is, not filling the casks quite full, so that when the must ferments everything will remain in the cask; others preferring fermentation *above*, *i. e.*, filling up the casks full, so that the skins, etc., which may yet be in the must, may be

thrown out of the bunghole by the fermentation. Both methods have their advantages, but I prefer the latter, with a very simple contrivance to exclude the air. This consists of a tin tube, built in the form of a double elbow, of which one end fits tightly in the bunghole, and the other into a dish of water, to be set on one end of the cask, through which the gas escapes.

The wine then remains in the cask until fermentation is over, when the bung is closed tightly, and it is left until perfectly clear, when it may be racked off into other casks. This should be done in February or January. Rack it off into good, clean casks, taking good care to thoroughly scour the casks in which the must has fermented, as the lees of the wine are very slimy, and must be carefully scrubbed off. A second fermentation will ensue in May or June, after which the wine should be racked again, and it is then fit to bottle or remain in the casks.

PART XII.

CALIFORNIA WINES AND WINE VINEYARDS.

Excellent quality of pure California wines: bogus imitations denounced; Report of a Committee of the Horticultural Society of St. Louis on Samples of (reputed) California Wines; they reject the bogus, and approve the pure specimens; chemical analysis of California wines by Dr. Wetherell, of the Smithsonian Institute; New Orleans Delta's, and the New York Home Journal's, opinion of California wines; Mr. Bugbey's exhibit of, at the State Fair at Sacramento, in 1866; exhibition of, by several vintagers, at the San Joaquin District Agricultural Fair of 1866; wine vineyards of Los Angeles; Anaheim; Angelica wine, and how made; Burgundy wine, made at the Sollah Vineyard, Placer County; wines of Solano County.

THE good reputation to which the wines of California are entitled from the innate fine qualities, the rich saccharine properties, the delicious aroma, which characterize our pure wines, has been greatly impaired by the impositions practised by jugglers in the business, who have attempted to improve upon Nature, or rather to improve their pecuniary condition by palming off upon the public the bogus, doctored adulterations which are so often met with in the wine markets, especially in the Eastern States. An example of this kind has recently come to our notice. From a Report made by a Committee of the St. Louis Horticultural Society, in the month of September, 1866, on the subject of some specimens of California wines presented to them for their examination, we make the following extracts:

Your Committee came together to examine five bottles of wine referred to them by the society at the last meeting. These bottles were labeled as follows, viz.: Hock, Mound Vineyard, Port, Sherry and Angelica, all five bottles purporting to be from Lake Vineyard, Los Angeles, California. Your committee were at once impressed by two peculiarities in these wines, quite different from any native or pure European wines they have ever tasted. First, they were very sweet, and, second, they were very strong in alcoholic product, which appeared and smelt marvelously like brandy. Not being able to decide upon their real quality from having no standard with which to compare them, your committee invited together some of the best judges of wine in the city, who are not members of the society, together with a few members, including our worthy President. The labels on the bottles had all been carefully removed, and these gentlemen, having no knowledge of the source from which the wines came, were invited, after a careful examination, to give their opinion in writing. This request each one, without consulting the opinion of any other, cheerfully complied with. The result was perfectly unanimous. All agreed that, while these samples of wine were strong in alcohol, and to some tastes might be considered pleasant, they were not the pure, unadulterated juice of the grape. One of these gentlemen, who is perfectly familiar with different foreign and native wines, contented himself by writing, "Please set before me wines such as come right from the press. I know nothing about cooked wines, such as I believe these to be." Another, himself an eminent physician of this city, declared that to him these wines all appeared to be "doctored." Your committee cannot avoid coming unanimously to the same conclusion. They do not consider these samples of wine

to be the pure unadulterated juice of the grape, and admit a possibility that they are not the product of the California vineyards. They are rather confirmed in their convictions by examining a sample of pure California wine, imported from that State for private use by Morris I. Lippman of this city, and courteously furnished the committee for examination by that gentleman. This sample exhibited the finest characteristics of the white or amber-colored wines of Southern Europe, with the distinct grape taste, and was in all respects totally unlike the samples which your committee had under examination. They cannot therefore conscientiously advise the St. Louis Horticultural Society, by indorsing these wines, which are said to be for sale in large quantities in this city, to commend them for general use by our citizens.

Very respectfully submitted,

(Signed), W. F. Cozzens,
D. F. Jewett,
Charles Peabody,
Committee.

This one bottle, pronounced pure wine, was from Sonoma County, in this State. It is barely possible that this committee, inasmuch as they did not make an analysis of the wines before them, may have been somewhat mistaken, not being familiar with the peculiar qualities of our California wines.

Analysis of California Wines.—That the true qualities of our wines may be understood, we give, from an examination of Dr. Charles M. Wetherell, of the Smithsonian Institute, the subjoined Analysis of California wines:

	Specific gravity 62 per ct.	Specific gravity of the wine, free from Alcohol.	Volumes per ct. of absolute alcohol.	Calculated per ct. of sugar from the density of the wine, free of alcohol.	Per ct. of sugar, determined by Fehling's test.	Per ct. of acids, all estimated as dry tartaric.
* Sonoma Valley white wine	0.9933	1.0050	8¾	1	Trace.	0.500
* Ditto red wine vintage, 1858	0.9944	1.0078	10	2	"	0.416
* Angelica	0.9812	1.0655	15	16	16.13	0.259
† Muscatel	1.0500	1.1730	19	18	16.63	0.259
† Angelica	1.0515	1.0718	16¾	17	17.24	0.314
California Hock, vintage, 1860	0.9893	1.0074	14	2	0.83	0.389
Port	1.0086	1.0305	18	7¼	6.76	0.324

* Presented by Senator McDougal. † Presented by Perkins and Stern.

It will thus be seen that our better class of California wines are very rich in grape sugar, as well as grape alcohol, two prominent and important ingredients in making good wines, and obviating the necessity of using either cane sugar or extraneous alcoholic preparations.

It is this excellence and virgin purity of our California wines, in their elemental state, that makes them in such demand, for medicinal purposes, as well as for sacramental uses. We understand that the Medical Department of the United States Army ordered the use of our native wines in their hospitals, where they could readily be obtained.

The New Orleans Delta has the following on the subject of

California Wines.—As to the California wines, who that has ever tasted the prodigious and lucious grapes of Los Angeles will believe that New York or Ohio can compete with California in the quality of their wines. The principal trouble with the California grapes is their excess

of saccharine matter, the study has been how to make light wine, such as will ripen in three years. The California "port" is "poor," simply because the call for it is so great for medicinal purposes, that it has not yet been permitted to acquire age requisite for that class of wine to attain its proper qualities as a beverage of luxury.

California Wines; Their Popularity at the East.—The New York Home Journal says: The opening of the California wine region is most opportune. There, in the virgin soil and the bland atmosphere of the sunny slopes of the Pacific, the vine flourishes in all its pristine health and vigor. It grows almost without human care, spreading its branches over the earth, and bearing its rich loads of fruit year after year, scarcely failing once in a century. California is unmistakably one of Nature's most carefully prepared wine gardens. It is not surprising that these wines have become so popular in this country, and are taking the place of all others. To persons whose tastes have been perverted by the fiery, vitiated compounds which pass in the market for foreign wines, these pure California juices seem at first rather weak, and their delicate aromas and flavors fail of appreciation; but all natural, healthy tastes find in them the requisites of a perfect wine—a refined and delicious enjoyment of the palate, a genial nutriment which assimilates kindly with the blood, and a gentle stimulant which imparts permanent tone and vigor to the system, without the injurious reaction of drugged and alcoholic mixtures. Such being their character, we cannot but rejoice to see them coming into general use, believing, as we do, that their introduction must tend powerfully to promote health and temperance.

Mr. Shaw, the English authority before quoted in this Work, speaks thus: The wines of California offer a fair

comparison with those of Europe; and the Germans have already shipped them to their countrymen in Bremen and Hamburg.

At the California State Agricultural Fair for 1866, Mr. Bugbey exhibited nineteen varieties of wine, including white, red and sparkling, from the most approved wine grapes, mostly foreign varieties, and he intends to forward samples of the same to the World's Fair at Paris. They are scarcely more than a year old, but are described as having a fine flavor and sufficient body to warrant the belief that with age they must acquire a much higher character and value. He puts his new wine into vats holding 800 gallons, and draws it off into redwood pipes and 40 gallon casks. The redwood is divested of coloring matter and taste by being first steamed, then soaked in salt water and washed.

Mr. Bugbey made during the past season some 10,000 gallons of wine, which he sells readily for $1 25 to $2 00 per gallon.

At the autumn fair of the San Joaquin Valley Agricultural Society, 1866, the following awards were made for California wines produced:

The Committee on Wines award the premium to C. Detten, for best white wine, two years old, 1864; F Ressler, best white wine, one year old, 1865; C. Detten, second best white wine, one year old, 1865; F. Ressler, best red wine; William Lottman, second best red wine, made from Black Hamburg grape; C. Detten, best port wine, two years old; West Brothers, best port wine, one year old; C. Detten, first and second best claret wine; L. F. Jarvis, best sherry wine; Dr. N. Longworth, best grape brandy, first and second premium; C. Detten, best Angelica wine, a special premium recommended; C. Detten,

a special premium recommended for Tokay wine. For samples of white and Malaga wines, made by Perry & Co., of Long Bar, Yuba County, and entered by W. F. Freeman, special premiums were recommended. To C. Detten, for still white and red wines, and for best exhibit of wines, special premiums were recommended. To sample of Sonoma champagne, of very fine quality, exhibited by West Brothers, a premium was recommended.

We think it not an extravagant estimate to put down the wine product of California, for the year 1866, at 3,000,000 gallons.

Wine Vineyards at Los Angeles.—A gentleman of Stockton wrote to the Independent a very interesting article on the subject of the vineyards of that locality, from which we extract the following: The vineyards are mostly located in the suburbs of the city; the avenues leading to them are wide and beautifully shaded with willow trees. Wolfskill's is the oldest and contains the greatest varieties of fruits. He has one hundred and forty acres under fine cultivation. The vineyard contains fifty-five thousand vines, of the Isabella variety of grape; two thousand orange trees, the branches bearing down under the weight of that delicious fruit; groves of English walnuts, lemons, figs and almonds, are found on this place—the trees all bearing prolifically, and the fruit of the most delicate flavor.

The Sansevain vineyard is the most extensive in Los Angeles. He gives his attention most exclusively to the growing of grapes; cultivates about two hundred acres of land, has seventy-five thousand vines, and makes on an average, yearly, 100,000 gallons of wine. He is erecting new buildings and increasing his capacity to produce a larger quantity. The high duties on imported liquors

have caused this valley to be more justly considered and better appreciated, and the wine makers look forward to the time when California wine will rank prominently among the best produced in the world. Mateo Keller has a fine vineyard with groves of orange, lemon and walnut trees.

Anaheim.—Of this new German wine town, near Los Angeles, where much of the choice California wines, the Port, Angelica, Muscatelle, etc., are produced, the Wilmington Herald says: The place was commenced in September, 1857, as a joint stock company, but after one year each owner selected his lot and took it under his control. The settlement contains 1,265 acres, divided into fifty vineyards, and sixty-four town lots. The vineyards have 600,000 vines, 450,000 of which bear at the present time.

Angelica Wine, and how made.—Angelica is said to be made by mixing one gallon of grape brandy with three of grape juice, fresh from the press. It is a thick, sweet and strong drink, yet of very delicate flavor.

Frochling and Kohler's method.—Reduce the pure fresh juice about one-fourth or one-fifth by boiling, then place it in barrels, and rack it off once or twice till it gets clear. Neither kind of Angelica ferments, the brandy and the boiling serving as preventatives, though it is thought the Angelica made by the latter method would ferment if long exposed to the air in a warm place.

Burgundy Wine in California.—The Placer Herald, speaking of the Sollah Vineyard, of which Mr. L. E. Miller is proprietor, says: He has presented for our consideration and taste, wine of last season's vintage, made from the Black Burgundy grape. We find it quite palatable, and free from the strong alchoholic qualities that are found as an objection to much of the California wine. He imported the vines himself, and finds the variety of

grape so well adapted to our soil and climate, that he intends cultivating it extensively; he is confident, also, that it will grow in favor with the viniculturists of the State.

Wines of Solano County.—We have tasted some very fine wines made in Solano County. The Solano Press speaks thus of these wines: Solano County can produce, and has produced, wines superior every way to the sparkling Anaheim of Los Angeles, or the best white wine of the Buena Vista Association. Hittell and Haraszthy to the contrary, notwithstanding. The Wolfskills' of Puta Creek raise the greatest abundance of grapes, but they have devoted but little attention to wine making. In Green Valley, however, are several fine vineyards, owned mostly by Germans, which furnish an excellent quality of grapes for the wine press, and, as those who attend to their cultivation understand the mystery of making good wine, and have had experience in the Old World, excellent claret and white wines have been produced, and other qualities can be manufactured. Some of them rival champagne in their sharp and pungent taste, and would grace the table of any connoisseur. When our vintagers commence to cultivate the Catawba grape, and send their wines to the State and District Fairs, so that their merits can be properly tested, the demand for Solano wine will far exceed the supply.

Grape Brandy.—The Wine Growers' Convention, lately held in Napa City, represented to the Secretary of the United States Treasury the oppressiveness of the new law relative to grape brandy, and they have received from him a dispatch to the effect that he has instructed Internal Revenue Collectors in California to permit wine growers to make brandy under the old law.

SOME OF THE PRINCIPAL VINEYARDS AND WINE DISTRICTS OF CALIFORNIA.

	No. of Vines.
Sonoma, Buena Vista Society	1,250,000
" other vineyards	1,188,000
Los Angeles	2,000,000
Anaheim	600,000
San Gabriel	150,000
Cocomongo	160,000
Green Valley, Solano County	200,000
Milton Wolfskill's, Puta Creek, Solano county	50,000
Sathaiel Wolfskill " "	50,000
John Wolfskill, (estimated) "	50,000
M. R. Miller, Pleasant Valley "	50,000
Napa Valley	1,000,000
Santa Clara	1,000,000
Sonora	150,000
Oroville	75,000
San Joaquin Valley	4,000,000
Calaveras County	364,000
Butte "	500,000
El Dorado "	1,164,418
Nevada "	120,000
Placer "	367,000
Siskiyou "	20,000
Shasta	1,500,000

There are, altogether some forty grape growing counties in the State of California, which will probably increase the number of vines to near fifty millions; and the amount of wine, as before stated, may be estimated at 3,000,000 gallons for the year 1866.

PART XIII.

EUROPEAN WINES.

Port wine, how it is made in Oporto; a strong infusion of brandy deemed necessary to enable the port wine to keep and bear transportation; Portuguese wine measure; Rhine wines, and of what grapes they are made; vintage of 1865; wine growing in France; a French proprietor pays 4,000,000 francs for a vineyard, and pays for it from one vintage of the same; Madeira wine, and the grapes of which it is made.

Port Wine, how it is made in Oporto.—In the work of Mr. Shaw of London, to which we have before alluded, is the following note of the mode of making port wine, in the Oporto wine districts of Portugal, by Baron Forrester, who spent much time in those districts, and his investigations seem to have been thorough and complete.

To produce black, strong and rich wine, the following are the expedients resorted to: The grapes being flung into the open vat, indiscriminately with the stalks, sound and unsound, are trodden by men until they are completely smashed, and then left to ferment. When the wine is about half fermented it is transferred from the vat to *tonels;* and brandy (several degrees above proof) is thrown in, in the proportion of twelve to twenty-five gallons to the pipe of must, by which fermentation is generally checked. About three months afterward, this mixture is colored, thus: a quantity of dried elderberries is put into coarse bags; these are placed in vats, and a part of the wine to

be colored being thrown over them, they are trodden by men till the whole of the coloring matter is expressed, when the husks are thrown away. The dye thus formed, is applied according to the fancy of the owner, from 28 to 56 lbs. of the dried elderberries being used to the pipe of wine! Another addition of brandy, of from four to six gallons per pipe, is now made to the mixture, which is then allowed to rest for about two months. At the end of this time it is, if sold, sent to Villa Nova, where it is racked two or three times, and receives probably two gallons more of brandy, per pipe, and it is then considered fit to be shipped to England, it being about nine months old. At the time of shipment, one gallon more of brandy is usually added to each pipe. The wine thus having received at last twenty gallons of brandy per pipe, is considered by the merchant sufficiently strong.

It is thought impossible to make port wine bear transportation or keep five years, without extraneous spirits.

Mr. Shaw says: I do not believe that there is anything so peculiar in the soil or climate of Portugal, as to render the juice of its grapes different from that of every other wine growing country; though I can understand that black grapes, of the deepest tint and heaviest substance, fermented with the husks and stalks, besides extraneous matter to give all the color and body possible, must contain an amount of fermentative principle destructive to its fermentation.

The percentage of proof of spirit in the best port evolved in fermentation, may be averaged at 20 per cent.; but in addition to this there is usually added, in quantities of three, four or five gallons, from fifteen to eighteen gallons to every pipe, before it is shipped to England.

In 1701, Douro wines sold in the wine countries at ten

millreas, about £2 15s., per pipe; in 1731, at forty-eight millreas, about £13, per pipe; in 1755, at twelve millreas, about £3, per pipe; in 1779, at thirty millreas, about £8, per pipe.

Portuguese Wine Measure.—A butt of sherry is 108 gallons; a hogshead, 54 galls.; a quarter cask, 27 galls.

We have thus seen that the best of port wine is not a little "doctored." But our vintners could scarcely afford, in California, to use such expensive material as brandy, to doctor their port wine with. To give $6 to $8 a gallon for brandy, and sell their wines at less than $1 per gallon, would scarcely pay. And besides, there is no need of doctoring our California wines with brandy, as they have, in their own natural composition, quite enough of the strong material, having from 10 to 19 per cent. of pure grape alcohol.

Rhine Wines, and of what Grapes they are made.—Shaw says: The wine district most favored by nature is the Rheingau. It is situated on the right bank of the Rhine, extending about 25 miles, *i. e.* from Walluf to Lorch; and is about eight miles in width. The whole region is a chain of hills, which, extending along the river, produces the world-renowned Rhine wine. The steep hills are formed into terraces, one above the other, to prevent the soil giving away. On smaller hills this is not necessary. The greater part of the grapes grown here are the Riessling; besides, there are a large number of Oestreicher, Kleinberger, and Klibroth. Orleans grapes are more scarce. The Riessling makes the best wine in good years. The Orleans grapes cannot be cultivated in cold, flat soils, as they require much warmth. They are generally planted on sunny hills. Hochheimer is usually considered among the finest of the Rhenish wines; the wine called Hock is

supposed to take its name from this place, where it originated.

The European Vintage of 1865.—Rev. E. S. Lacy, of San Francisco, who has been for a year or two traveling in Europe, writes, April 1st, from a village on Lake Leman, Switzerland, that he has just paid a visit to the Rhine country, where vines do most abound, and that his information was to the effect that the vintage of 1865 is accounted one of the best of the century for wine—the autumn warm, dry and long. They always defer vintage as long as possible, and avoid frost, that the "blood of the grape" may become rich and sweet. Vineyard land is worth from $800 to $3,000 per acre, along the banks of the Rhine, and wherever the exposure is good, the grape culture crowds out every other.

Wine Growing in France.—The area of vines in France is nearly 6,000,000 of acres. The estimated produce of the wine crop of 1865, an unusually good year, is 1,000,000,000 gallons, or about 140 gallons per acre. 2,304,000 gallons were exported to Great Britain in 1864, against 583,000 in 1854. All those, says a late writer, acquainted with the rural population of France, know that their health, strength and activity are remarkable, particularly when the small consumption of animal food is considered. This is attributed to the wholesomeness and life-giving properties of their cheap ordinary wines. A peasant in the wine district is rarely seen intoxicated. He buys wine, or makes it himself at a cost of about two-pence or three-pence the bottle. It consists solely of the juice of the grape; nothing whatever is added to give it increased force, or an improved flavor.

A French proprietor lately paid four millions of francs for a tract of land where Medoc was the favorite wine;

and he has realized the full amount of the purchase money from the crop of 1864, alone.

The Madeira Wine in common use, is made from both a white and black grape, of a small size, generally mixed together, either at the time of pressing, two or three rackings being sufficient to take off all the dark color. It is said that grape which produces the Madeira wine is the same that produces Hock wine in Germany; the vines have been shifted back and forth to prove this. The Catawba vines from the United States have been tried in Madeira, with good success.

PART XIV.

COLD GRAPERIES.

Little need of Cold Graperies in California; required at the East; plans of various kinds described.

In a climate like that of California, where the most tender varieties of foreign grapes are grown successfully in the open air, at least in most parts of our State, there is little or no need of Cold Graperies, such as are now becoming quite common in the States East. And yet, in San Francisco and its immediate vicinity, neither the foreign nor native grapes succeed well in the open air, owing to the cold, harsh sea-winds, and the almost perpetual recurrence of heavy, damp fogs. Hence, those who wish to grow the grape must do so under glass; and this can scarcely be recommended, in a country where every variety of exotic grape grows so readily, except as a matter of fancy by gentlemen of means who wish to adorn their home-grounds, and have the pleasure of sitting occasionally under their own vine and fig tree.

And those in the States East who find it necessary to adopt this system of cultivating the grape under glass, will find it necessary to resort to books more elaborately devoted to that branch of grape culture, than can be expected in a hand-book of this description, intended principally as a guide to those engaged in the out-door culture

of the grape. But that no branch of our subject may be neglected, and as an incentive rather than aid to those who may desire structures of the kind, we give a description of one erected at South Manchester, Connecticut, which we find in Woodward's "Graperies and Horticultural Buildings," a work that will be found useful for reference, by those who wish to go extensively into the culture of the grape by the various modes of artificial heats.

A Cold Grapery.—In case of the one above alluded to, the house is twenty feet wide and sixty feet long; the foundation is a stone wall, with a drain under it; immediately above this is a hollow brick wall, its base being on a level with the ground on the outside, but the earth is embanked against the brick wall to within an inch of the sill. A small house is built at the north end, which is used for tools, for potting, etc. The border is about three feet deep, and occupies the whole interior of the house. There is no outside border. On the bottom is placed about one foot of "tussocks," from a neighboring bog, which may in time decay. The border is made up pretty freely of muck, with the addition of sand, loam, charcoal dust, bone dust, etc. There is a row of vines, two feet and a half apart, at each side of the house; and two other rows, inside of the others. There are also a few vines in the centre and at the ends of the house. The outside rows form fruiting canes half way up the rafters; the next or inner rows go to the roof with a naked trunk, and furnish fruiting canes for the other half of the rafters. The fruiting canes are thus very short and easily managed. The house was planted in the month of April, with such grapes as Black Hamburg, Victoria Hamburg, Wilmot's Hamburg, Golden Hamburg, Muscat Hamburg, Chasselas, Fontainebleau, Frontignans, Muscat of Alexandria, Syrian, Esperione, Tokay and some

others. The plants were very small, and the wire room injured some of them so as to make it necessary to replant; but the growth of those not injured was very good. A fine crop of melons, tomatoes, strawberries, etc., was taken from the house the first year. The second year a few bunches of grapes were gathered, and everything went on finely.

This is the third year in which the house has been in operation. Our last visit was in the early part of August, 1863, when we counted 734 bunches of grapes, weighing from one to seven pounds each—the Syrian being the grape which reached the last figure. Almost as many bunches were thinned out. In some cases too many are left, but they look very fine. The Muscats are extremely well set, and some of the bunches will weigh fully three pounds. The Black Hamburgs look quite as well; but the finest show of fruit is on the Esperione. The large number of bunches is owing to the manner of planting; so many could hardly be taken the third season from a house planted in the ordinary way. The canes, it will be borne in mind, are now only fruited about half their length.

The exposure of this house is a very bleak one, and the climate cold and fickle. In order to provide against a late spring frost, a coil of one-inch pipe was inclosed in brick work, with a fire-chamber under it. From this coil a single one-inch pipe was carried around the house next the side sashes. It is found to answer the purpose, having on one occasion kept the frost out of the house, when the crop in the house of a neighbor was destroyed. In many places some recourse of this kind is necessary, and a small boiler with a single pipe will, in most cases, prove sufficient.

These houses have, of course, their sides and roofs of glass. On this part of the subject, a writer in the same

book says: We are now adopting for plant-houses, low, narrow, span-roofed buildings, formed by six feet sashes, one on each side, the *ends* of the houses facing north and south. These we attach, three together, on the "ridge and furrow" system. This system presents great advantages, and by using no cap on the ridge piece, air is given in the simplest and safest manner, by the sash being raised by an iron bar nine or ten inches long, pierced with holes, which answers the double purpose of giving air and securing the sash, when closed, from being blown off by heavy winds. There is no necessity for the sashes being hinged at the bottom, as might be supposed; all that is required being to nail a cleet along the wall plate, fitted tight to the bottom of each sash. Every alternative sash is nailed down, the other is used in giving air in the manner described.

On the subject of "culture under glass," Mr. Strong, in his new and excellent work, says: Glass-houses are in use for two purposes; first, as a protection for varieties that are otherwise too delicate to ripen well in our climate; and, secondly, for the purpose of ripening fruit out of the natural season. For the first purpose, a very slight protection is all that is essential. The Black Hamburg, and many other of the more vigorous European varieties, are found to ripen perfectly under a roof of glass; the back of the house being left entirely open throughout the season. Indeed, they have ripened well under single sashes left open on all sides. So simple is the requirement, that every householder may have foreign grapes growing under a temporary roof of sashes, with none of the care of ventilation; his main efforts being directed in training, and in guarding against mildew. But there are advantages in having close houses, in order to obtain entire control of the atmosphere, even for the summer crop.

As to the position, etc., of the grapery, the same writer advises a double or span roof, the ridge running as nearly as possible to the north and south. Thus the sun will have its utmost effect during morning and evening, while its fiercest rays will be mitigated by striking obliquely upon the glass at mid-day.

But a yet simpler and less expensive mode has been suggested, and is thus described in Elliott's American Fruit Growers' Guide. But expensive structures are not necessary; many a man at the West has a south side of a building unoccupied; this may serve as the back of his cold house, by setting up pieces of four inch scantling against the building, nailing boards to it, and filling in between with tan-bark, saw-dust, or fine charcoal, he has the back; now four inch square posts rising four feet from the ground at a distance of say fourteen feet from the back, boarded on each side, and filled in same as the back, make the front wall; leaving, however, two spaces six feet from either end, of about two feet square, for hanging shutters. Now the back wall being ten feet high, the ends are to be made in same way as the front, giving, of course, the slope from back to front, and leaving out at one end space for a doorway, and at the highest point of sides near the back at each end, a space for swinging shutters of say two feet square; these opened will give ventilation, in connection with those in the front wall. This done, a joiner will be required to fit on a plate of two inch plank all around, and fit in rafters and sash; the sash should be the entire length of width of house; styles four inch wide by one and a half thick, bars one inch wide beveled to half inch on the under side, the upper style or head piece six inches wide, the lower one fourteen inches; the rafters should be placed

so that sash cannot be over forty-two inches wide, or sufficient for five lights wide of six inch glass.

In California no artificial heat is required, either for a cold grapery, or a hot house; the sun is all sufficient during the coldest seasons of the year: unless it be in some of the Alpine regions of the Sierra Nevada mountains.

PART XV.

DISEASES AND INSECTS INJURIOUS TO THE GRAPE.

In California no damage will be done to the vine, either from disease or insects, if planted in proper places, out of the influence of fogs or moisture, and in the proper soils; mildew no new disease; how God, by his prophet Amos, smote the wicked people's vineyards and gardens, in his day, with "blasting and mildew," and allowed the "palm worm" to destroy them; the President of the Academy of Sciences of St. Louis, describes the appearance of the mildew and of the brown rot and the black rot; the oïdium of Europe; why California does not suffer from these diseases; kinds of grape most affected by these diseases at the East. Remedies for the diseases of the grape. Injurious insects; the aphis, slug, rose-bug, thrips, etc., how to destroy them.

In California, as we have already shown, there is seldom any damage occurring to the vine or its fruit, by any of the diseases to which they are subjected in other countries. The long dry seasons having no rains nor heavy dews from the time the fruit sets until it is fully ripened, giving ample time to secure the vintage and for the maturing of the raisin crop, etc., allows no opportunity of exposure of the grape to the usual diseases incident to it in more uncongenial climes. With proper care in the selection of sites for vineyards, adopting positions on rolling or undulating grounds where there is a free circulation of air, and no unwholesome miasma, it is rare that we shall find occasion to complain of the rot, mildew or oïdium, or any other disease.

But as this little book is expected to be read in regions less favored in climate than California, we must devote a few pages to the consideration of the ordinary diseases, and the best remedies that have been discovered by science and practical experience.

The blight and mildew are no new diseases; their history dates back to the pastoral days of the ancient patriarchs. God, through the prophet Amos, (Amos, iv. 9,) declares to his people, "I have smitten you with blasting and mildew; when your gardens, and your vineyards, and your fig trees, and your olive trees, increased, the palm worm destroyed them."

In the Transactions of the Academy of Science of St. Louis, Dr. Engleman, the president, describes two species of fungi destructive to vineyards. He describes first a species of *botrytis*, probably the *b. viticola*, of Berkley. It makes its appearance in the latter part of June on the lower, downy surface of the leaves. About the same time, the mildew appears on the pedicles, and often, also, on the young berries, when they are about the size of peas, or smaller. Dr. Engleman never saw it on full grown berries. Those attacked on their surface or on their pedicles, soon fall off; but the most material damage is done by the mildew infesting the leaves; whereupon the greater part of the leaves will gradually turn yellowish-brown, at their base, shrivel from that point, assume a club shape, and at last dry up entirely, usually remaining adherent to the withered racemes. This is the *brown rot*, so well known to all cultivators to their dismay. The second kind, the *black rot*, is brought on by a very different fungus, which Dr. Engleman thinks is undescribed by botanists. It makes its appearance only on nearly full grown berries, exhibiting in the first stage a discolored spot on the side,

but never at the base, of the berry, about two lines in diameter, with a dark spot in the center. This spot soon becomes light brown, and remains so; while the surrounding part of the berry gets darker, and exhibits a rough or (under the magnifier) pustulous surface; gradually now the berry shrivels up, and becomes black. The individual fungi are little spherical bodies formed under the surface in great numbers, which, growing, elevate, and at last burst, the epidermis; then open at their apex by a small jagged hole, and, shrivelling with the berry, eject a more or less curled or twisted thread, which, moistened, becomes gelatinous, and shows the innumerable oval sporules, each imbedded in its coat of mucilage.

This first species of fungus, which Dr. Engleman calls Botrytis, is thought to be identical with the European *Oidium Tuckeri*, which a few years since made such havoc with the vineyards of Europe, the Island of Maderia, etc. Another species (Erysiphe) is more commonly seen on the European varieties of grapes, and sometimes found on our native grapes, and it is feared may, at some future time, become a source of evil. It is described as being entirely distinct, developing upon the upper surface of the leaf in the form of a white powder, which spreads like a web, enveloping leaf and fruit. This may be peeled off with ease, leaving the foliage uninjured, as the roots of the fungus do not appear to penetrate the leaf to any extent. It is only a damp or moist climate that can generate or give life to this parasital fungus that goes by the name of mildew, and is so deleterious to the grape.

Downing recommends the use of ashes, mixed with the soil, as being beneficial in preventing mildew in localities subject to that disease. He says, young and healthy plants are seldom attacked by mildew, while old and feeble ones

are very liable to it. Our own observation has led us to believe that wood ashes are one of the most beneficial fertilizers for the grape, giving it the appearance of extraordinary luxuriance and health. The great productiveness and longevity of the vineyards abroad, which are formed upon a soil composed mainly of the spent ashes of volcanoes, and the acknowledged superiority of the grapes and wine yielded by such soils, are manifest proof of the value of ashes.

Why are the choice grape growing districts of California free from mildew, rot, etc.?—Because of the absence of rains or dews, during the grape season. Mr. C. A. Riche, of Boonville, Mo., in an article in the Gardener's Monthly, says: I have for many years been of the opinion that two things were essentially necessary for the healthy growth of the grape; namely, natural or artificial protection from dew, and thorough drainage. The reasons for entertaining this belief are these: Some ten years ago my father tried some experiments on three vines of the Isabella planted on the east side of the house. At first they were trained close to the wall, where they would be protected from dew, by the projection of the roof; and, while grown thus, they bore regular and fine crops of grapes. But subsequently they were permitted to run on some framework, so to make a kind of arbor in front of the house, and where the dew would fall on the leaves; after which the grapes invariably rotted, both on the arbor, and under the roof, and on the wall; and I have observed the same thing in other localities; thus showing that it is not the fault of the soil or climate, aside from the dew.

Again, Mr. Strong says: That mildew delights in a warm and muggy air, is beyond doubt. It is equally clear that though the vines have become debilitated, and in con-

dition to receive, and have actually received, the seeds, yet, if the weather becomes warm, dry and clear, the fungus will perish. It cannot grow in a clear, dry air.

Mr. Muench says: In California and Mexico the grapes never rot, for the atmosphere is generally dry and kept in motion.

Mr. Wilson Flint says: The *rot*, which is never known in California because of the absence of rains during the ripening season of the grape, seems to be the great scourge of the vintner in the Atlantic States and Europe, where rains are frequent while the grape is in an immature condition Many are of the opinion that the grape rot is caused solely by long-continued rains. This belief is true only in part. The superinducing cause of the rot arises from the fatal effect of what are designated as heated terms, when, for days and sometimes weeks, the atmosphere becomes arid from a brazen sky, under a sunshine so intense as to scald the sap in the foliage of the vine, and parch its leaves to such an extent that the tissues shrivel up, and the free circulation of the sap is impeded or destroyed. This parching atmosphere being succeeded by heavy rains, the leaves of the vine become saturated with an excess of moisture which they are unable to distribute through their diseased functions, to the long-famishing grape; hence decomposition takes place in the foliage, and, as a consequence, unwholesome food is transmitted to the grape, or sent to the termimal shoots, to produce enfeebled wood for subsequent bearing.

Mr. W. A. Woodward, in an essay in the Horticulturist, gives his experience in noting the kinds of grapes most affected by disease in the region of New York, and the times at which each was attacked. Under date of July 12, he says the grape rot appeared on the following varieties, some of

them to a greater degree than he had ever seen, viz.: Alexander, Anna, Catawba, Concord, Cuyahoga, Diana, Hyde's Eliza, Lydia, Le Noir, Logan, Mary Ann, Mead's Seedling, Manhattan, Mottled, Northern Muscadine, Perkins, Tokalon, Taylor's Bullitt. July 25, the mildew showed itself on the berries of Anna, Allen's Hybrid, Cuyahoga, Herbemont, Hyde's Eliza, Le Noir, Logan, Lydia, Mead's Seedling, Tokalon, and Rogers' Seedlings, Nos. 1, 4, 5, 9, and 22. August 10, the grapes that show no disease up to this present time are, Clinton, Creveling, Delaware, Franklin, Garigues, Hartford Prolific, Isabella, Israella, Maxatawny, Miles, Rebecca, York Madeira, and Rogers No. 3.

This writer suggests the following as some of the predisposing causes of this disease: 1st, the attenuation of the vine during its early stages, propagated from feeble wood, and especially from green cuttings, to supply the excessive demand at the highest prices; 2d, the temptations to convert weak plants into saleable ones, by growing them in *manure* beds, and watering with chemical preparations to induce unnatural growth; 3d, unnatural (sometimes called scientific) pinching and heading-in of the vines during their growing season, continued from year to year, experience shows, adds this writer, that this treatment will develop disease in the fourth and fifth year (if not before), and will insure it ever after. The leaves are first affected, then the canes, then the fruit. Some fruit has the black rot only; others show first fungus on the fruit, and by the seventh year, both may be found on the same bunch. In all my examination, I find the laterals pinched in, and the bearing canes headed-in.

Our essayist does not, we presume, intend to discountenance *all* pinching-in, or heading-in of vines, because an excess of this may, as he thinks, have affected injuriously the

health of the plant and fruit, in some cases. In many of the oldest vineyards of Europe this system of pinching and heading-in vines has been practiced for many years before they ever suffered severely from the mildew or oïdium.

But as we have discussed this subject more at length under the head of *Pruning*, it is unnecessary to say more in this place. We will merely add, that Mr. Muench, who has much practical experience in the culture of the vine, says: That the disease may be mitigated by *pruning the vines very close*, rather than too little, since a strong growth resists better the injurious exterior influences. After giving the various remedies proposed for the cure or avoidance of these diseases, Mr. M. very curtly says: After what has been said, it would be foolish to expect to find a remedy to act as a charm against rot. *None can be found*, since we cannot change the climate of America. The author should have made an exception to that part of America known as *California; here* we need no such change.

Remedies for the diseases of the Grape.—Although, as our vinicultural friend, just quoted, remarks, there may be no effectual remedy for these diseases, short of a change of climate, yet, as *all* our American people can scarcely be expected to come to California, at once, or even all those engaged in grape culture, it is well to give them an account of such remedies as may have been discovered to mitigate, if not entirely prevent, these diseases.

The great panacea has generally been, in these diseases, the use of *sulphur* in some form or other. On this subject Dr. Strentzel, in his prize essay, says: Of the many preventives which have been tested here, sulphur is by far the most efficacious. Its particles coming in contact with the spores of oïdium destroy their vitality, and as brimstone is also antagonistic to insect life, it is in a great measure a

preventive of their depredations. To be successful, the buds at the time of frondescence should receive a good sprinkling, again when the blossom racemes are fully developed, and a third when the grapes are the size of small peas. Some contend that the dusting with finely pulverized clay has the same effect; but this does not conform with our experience. Others advise the use of salts of copper, to which we emphatically dissent. All compounds of copper are virulent poisons, and even in small quantities, though acting slowly, surely destroy animal life.

Sulphur is very generally used, either in a powdered state or prepared as a liquid. For mildew, a wash is recommended, made of water, sulphur and lime, applied with a syringe.

German Remedy for the Rot.—Dr. Franz. Vulkan, of Eppau, in the Tyrol, having learned by experience that the parasites of vegetables cannot exist on animal matter, has discovered a remedy for the grape disease. He dissolved two and a half pounds of common glue in ten gallons of water, by boiling, and then cooled the solution until it was neither too stiff nor yet too watery, but had the appearance of lye. Diseased grapes were dipped in this solution, and after forty-eight hours they assumed a lustrous, dark green color, like that of those that had not been attacked. In September, they ripened into the finest fruit. In places where large tracts of vines were struck with the blight, single clusters were dipped, and these were healthy and gave very fine fruit, while all the rest rotted.

We should doubt, however, if this process would improve the grapes, although it is said not to injure them at all. It would, however, be rather a tedious and expensive process for a large vineyard. It may answer in small vineyard culture.

Insects.—The aphis and slug, which in some latitudes appear in May and June, may be destroyed by syringing with tobacco-water. The grape-vine flea-beetle, (*Haltica Chalybea,*) a small, glossy, greenish-blue beetle, about three-twentieths of an inch long, sometimes preys upon the buds, causing them to have the appearance of having been bored. The eggs are deposited early, and soon change to a greenish, smooth worm, which preys upon the tender leaf and young bunches. It may be destroyed by syringing with tobacco-water, or sifting lime over the vines when wet with dew. The rose-bug (*melolontha*) sometimes attacks the vine in large numbers, eating off the upper surface of the leaf, and causing the fibres left to appear like a sieve. They may be destroyed by spreading a cloth underneath and shaking the vines in the cool of the evening, or early in the morning. They may thus be easily gathered up and burned.

The Thrips.—Dr. Trimble recommends a strong solution of tobacco to destroy the thrips. Had observed that a very hot day would destroy them; once, in particular, with the thermometer at 100°, thousands were killed, and the vines cleared. Another authority, Josiah Salter, says, what is called *thrips* was better known as *fretters*, a small whitish fly. Tobacco smoke will kill them when it can be confined. A solution of tobacco and whale oil soap is also an effectual remedy, applied with a sponge.

PART XVI.

MISCELLANY VINICULTURAL.

No fever and ague where the grape succeeds well; raisins in Sacramento County; B. N. Bugbey's vineyard; extensive vineyard in Napa; Samuel Brannan's; wine as a substitute for strong drink; the New York Journal of Commerce's opinion thereon; California fruit for the World's Fair; how put up; American wines; Ohio vintage; a German vintager's success in Iowa; profits of grape culture in Illinois; Ohio Lake Shore vineyards; the varieties of the grape they plant; diseases of; extent of the Lake Shore grape region; grape growing enterprize in Virginia; preservation of fruit; report of the Northern Ohio and Lake Shore Grape Growers' Association; *curative qualities of the grape;* trouble in the French vineyards; wine crop of France; French wines; Hock vineyards of Germany.

As there are some matters connected with grape culture that did not seem to come very appropriately under either of the preceding Parts of our Work, we devote to them a separate chapter, as the closing Part of our Book.

California Items.

No Grapes in Fever and Ague Districts.—Grapes are not only wholesome as an article of food, but the thrifty growth of the vine is an indication of a healthy climate and neighborhood. In the chapter of George Husmann's excellent work "On the Cultivation of the Native Grape,"

wherein he treats of the soil and locations for vineyards, he states that "he was much struck by the force of a remark made by a medical friend last summer, when, in consequence of the continual rains, the ague was very prevalent." It was this: "Wherever you find the ague an habitual guest with the inhabitants you need not look for healthy grape vines." The Prairie Farmer, published at Chicago, thinks there is "something in it," and says, in support of the theory: "When we recall the fact that the same kind of weather which produces the rust on wheat, almost invariably, in new settled sections, brings with it the fever and ague, and that an unusual excess, or that peculiar wet and hot weather last August and early September, ruined nearly one-half of all our Delawares in this State, and badly mildewed the leaf of all our native vines, with, perhaps, the exception of the Concord, Northern Muscadine, and Blood's Black, we shall see there is much pertinency in the remark." There are localities in California, as the Sacramento Bee observes, where the grape is subject to mildew and other diseases. Again, in certain localities, the vines are thus affected only at intervals, while in other seasons they are quite healthy. The hint given above would suggest to vine-growers the propriety of instituting observations and experiments in this matter. If the disease be in the vine, it would need one class of treatment; if it is caused by malaria in the atmosphere, it would require an entirely different course—if, indeed, it might not be given up as incurable.

Raisins in Sacramento County.—Speaking of the raisins manufactured in Sacramento County by B. N. Bugbey, of the Natoma Vineyard, and recently mentioned in the Union, the Folsom Telegraph says:

Bugbey is the only man in the State engaged in this

business extensively. His raisins have been reported regularly of late in the San Francisco papers in their market reports. Three or four years ago the ground occupied by the Natoma Vineyard was a black and barren looking spot, and to show what can be done by energy, the product of his vineyard this season has been about ten thousand gallons of wine, one thousand gallons of brandy, and one thousand boxes of raisins, containing twenty-five pounds each, and selling as fast as they can be delivered in the San Francisco market at five dollars per box at wholesale. The soil of the foot-hills is proving itself far superior to any of the southern portion of the State for the successful and profitable cultivation of the vine.

Extensive Vineyard.—The Napa County Reporter says Mr. Brannan has planted all the hills immediately adjacent to the Calistoga Springs with grape cuttings this season. Many of them are choice foreign varieties, planted with a view of testing the adaptability of the soil and climate of the upper part of Napa Valley for producing a superior wine and table grape. Five hundred thousand cuttings have already been set out, which, when in vigorous growth, will temper the atmosphere, heated by the boiling cauldrons around the Calistoga, to a more endurable heat.

Wines as a Substitute for Stronger Liquors.—The New York Journal of Commerce says: The introduction of good wines into ordinary use as a substitute for stronger liquors, is a consummation devoutly to be hoped for. If we could grow good wines ourselves, on our own hills and fields, we should have great confidence in the future realisation of such a hope. Nor is it as yet certain that we cannot. Obviously there has not yet been any such success in producing wine in the United States, east of the Rocky Mountains, as to justify the expectation that the people

will ever take to it as a regular article of food, and substitute it for coffee and tea, or rum. There are no wines yet grown in the Atlantic States which rank well enough in quality to promise a low grade article for the poorer classes that shall be good and cheap. But the product of California is totally different from any other grape juice grown in America. The Pacific slopes will unquestionably give us good wine in abundance before many years.

California Fruit for the World's Fair.—We learn, says the San Francisco Bulletin, that California will be represented in the fruit department at the World's Fair at Paris, in 1867, in the following manner: Some months since, a gentleman, who has a fine vineyard and orchard near Alviso, had a number of water bottle shaped jars made at the San Francisco Glassworks at Steamboat Point. These jars have a mouth about two and a half inches wide and twelve inches high, and have a round-formed bottom, six inches wide, with a small hole in it. The jars were to be placed over young fruit, so that it could in time fill the inside, accommodate itself, in growing, to the shape of the jar. The fruit, when ripe, is to be carefully cut off and the stem secured, so that a cork can be sealed over it. Through the hole in the bottom the jar is to be exhausted of air and hermetically sealed. It is said that the absence of air will insure the keeping of fruit for an indefinite time, while the jars being strong will admit of safe transportation to any part of the world. The jars being of white glass, the fruit can be plainly seen through them. It is probable that similar attempts to preserve green fruit for the Paris Exhibition are being made in other portions of the State.

Items about the States East.

Grapes.—A letter in the October number of the Horticulturist, states that there are 5,000 acres on the shores and islands of Lake Erie devoted to the culture of the grape. The crop this year, he says, on 3,000 acres will average two and one half tons to the acre. This will give 17,500,000 pounds, which, at an average price of seven cents per pound, will be $1,225,000, or $350 per acre. A very profitable business.

American Wines.—At a recent meeting of the Wine Growers' Association, at Cincinnati, a sample of imported Johannisberg, which cost seventy-five dollars per dozen, was placed before the tasters, together with a specimen of the Ohio vintage of 1864, made from Delaware grape. The brands were concealed from the party, but the majority gave preference to the domestic over the foreign article.

Grape Culture.—The Keokuk Constitution says: A German resident of this city, four years ago last spring, bought ten acres of ground five miles from this city, on the rapids, and the same season planted four acres of it in grape cuttings. While the grapes were maturing, the recent summer, he was offered by a gentleman of this city $2,000 for the chances of his crop. He refused to sell, however, and his vintage has yielded him 1,800 gallons of wine, worth $2 a gallon, or $3,600 for one year's crop of grapes. This is an enormous profit, and seems more like the gold-finding stories of California fifteen years ago, than an incident of agriculture in Lee County, Iowa, and is strictly true.

Profits of Grape Culture.—The Messrs. Lawyers, of Cobden, Ill., planted a vineyard of 6,000 vines, Concords and Delawares. This planting was two years ago last

spring. Their crop the present year was 5,000 pounds, selling at from thirty to fifty cents per pound. This, their first crop, pays back all expenses. Should the rot destroy half the crop, it will yet pay to grow grapes at ten cents per pound. This is certainly very encouraging, and will doubtless induce many to engage in the business. There is another advantage in the fact that grapes can be grown upon land that would be otherwise useless.

Ohio Lake Shore Vineyards, Varieties—The Catawba still takes the first place. The Isabella produces a fine sparkling wine; it is not so hardy as the Catawba, and is liable to overbear. The Delaware holds its own; it is a splendid wine grape, and well adapted to mixing with the must of other varieties, to improve the flavor and give a better character. It is not as good a keeper for table use as some others. The Concord makes a very beautiful wine, and is a showy market grape. The quality of its wine is not high. The Diana is a fine table grape, and famous for keeping well; its wine has a peculiar flavor, not pleasant to some—agreeable to others. The Clinton is no mean grape for wine. It has sweetness and acid; requires a *poor* soil. The wine is rough at first, but improves in quality. It makes a fine red wine. The Iona is one of the new grapes that is very promising.

Diseases.—The mildew and rot are the chief drawbacks to the profits of grape culture. Some years the crop is nearly exempt; in others from one-fourth to one-half of the grapes are lost in a few vineyards, but the aggregate loss, as yet, has been small.

The Lake Shore Grape Region.—This extends along the whole length of the South Shore, and for several miles inland, and embraces the islands in the lake. It is the most southerly shore of any of our great lakes, and has the

advantages of a proper soil, a warm latitude, and the protecting influence of a large body of water on the north. The purchase of lands and the preparations for planting vines in the year 1866, surpass in extent any thing of the kind in this country before witnessed. Seven thousand acres are supposed to be already set with vines. Had the entire crop of grapes of last year been made into wine, it is estimated that the product would have been two millions of gallons.—Ohio Rep.

A Grand Grape growing Enterprise.—The Wheeling, Va., Intelligencer says that a joint stock company on a large scale is being formed in that city for the purpose of entering more largely into the grape growing business. It is proposed to raise a capital of $250,000. Nearly $50,000 have already been subscribed, and as soon as $75,000 are raised the company will go to work. The land to be worked is on the Ohio side of the river, near Martinsville, and fifty acres of it are already under cultivation, and it is designed to increase the size of working-land to one hundred and fifteen acres. The company, when all the stock is taken, will purchase a steamboat, and in addition to the grape culture, take out coal. A charter will be applied for, and then it will be a grand growing company.

Preservation of Fruit.—At the late meeting of the Western New York Fruit Growers' Association, Mr. Nice read a paper on the Preservation of Fruit. The great essentials to this were coldness, dryness, evenness of temperature, purity of air, and the absence of free oxygen, which was the great destroyer of fruit. Large buildings were being erected in Ohio, devoted entirely to the preservation of fruit. The profits on one season's fruit paid the entire expense of the buildings. Dryness of atmos-

phere was secured by using the refuse of salt works, of which the works at Saginaw, Mich., supplied what was wanted, at little expense.

Mr. Allen said that dryness was not essential in preserving some kinds of fruit. A gentleman in Le Roy had kept grapes in a very moist situation. At his suggestion, Mr. Hazelton of Le Roy, gave the mode there adopted. The grapes were buried in a pit about four feet deep, and kept constantly moist, the lower tiers often submerged in water. They were preserved in perfect order till late in the winter, and brought the highest price in the Buffalo market.

Grape Growers.—The Report of the Northern Ohio and Lake Shore Grape Growers' Association says: As to the extent of grape culture in the district covered by this Society's operations, Mr. F. R. Elliott, the former Secretary, after much inquiry and observation, has published his opinion that previous to the planting of the spring of 1866, there were not less than *six thousand acres* of grapes in the Lake Shore region, including the islands. And the President estimates that at least 1,000 acres more have been planted in vineyards the current season. Of the amount of wine manufactured in this region, the past year, Mr. Elliott gives the following estimate:

The section east of Cleveland, 40,000 gallons; the section west of Cleveland, 150,000 gallons; Cleveland and its immediate vicinity, 89,000 gallons; in all, 279,000 gallons.

The value of this wine at wholesale prices is between five and six hundred thousand dollars. Had the entire grape crop of last year been made into wine, the product would have been 2,000,000 gallons.

European Vinicultural Matters.

Curative Qualities of the Grape.—It is one great advantage of the homœopathic system of medical practice that the potions are easy to take. There are no hideous boluses to be swallowed, no repulsive-looking doses to torment the weakened palate—nothing but a sugar globule or an inoffensive tincture. Children plead for the medicine, and grown-up people make no wry faces over it, and call not for water to take the bad taste out of their mouth. But it remained for the philosophical German mind to advance a really practical step beyond Homœopathy. Having discovered one palatable remedy, the German intellect forthwith sets itself at work to improve upon the pattern, and produces one far more agreeable to the general taste, to the invalid and the robust—the "Grape Cure."

A pleasant writer in the London Review describes the process of this cure, and gives us an attractive picture of the place that has become its head-quarters. The "cure" is practiced at Meran, in the Tyrol, and at Vevay and Martreux, on the Lake of Geneva; but in Germany, Durkheim is the place which enjoys most fame. Durkheim lies on the left bank of the Rhine, in the Bavarian Palatinate, and is distant about fourteen miles due east from Mannheim. The nearest railway station is Neustadt, a small town on the line from Mayence to the French frontier at Forbach.

The surrounding region is one great vineyard. For some twenty-five miles the high road passes through the midst of a succession of vineyards, without a trace of any other cultivation meeting the eye of the traveler, and although immense quantities of wines are made from the twelve or fifteen different sorts of grapes which are grown there, almost an equal amount of the juicy fruit is diverted from

the bibulous to curative purposes. The process of the "grape cure" is at once simple and agreeable. It is thus described:

The grape cure lasts from three to six weeks. The regular season commences on an average about the middle of the first week in September, and lasts to nearly the end of October. Every thing depends on the state of ripeness of the grapes. The amount of grapes daily taken by persons undergoing the cure varies from about four and a half to seven or eight pounds; in some cases, as many as nine pounds are eaten.

They are taken three times a day, at the same hours at which mineral waters are usually drank in Germany—before breakfast, at 11 o'clock in the morning, or two hours before dinner, and at from five to six in the evening. Persons generally commence the cure with from two to three pounds a day, and advance daily in quantity till the larger limit is reached. The skins and the seeds should not be swallowed. The largest portion is usually consumed at 11 o'clock. Some doctors do not allow their patients to take any other breakfast than the grapes, accompanied by a roll of bread. The usual plan, however, is to permit them to take a breakfast of tea or coffee with bread, but no butter, after the grapes. A strict diet is universally prescribed; all fat, sour, or spiced meats, and pastry, are forbidden; a small quantity of white light wines is permitted, but red wines, beer and milk must be avoided. The evening meal should be a very light one. This system pursued at Durkheim is the same as the one followed at the other places where the grape cure goes on; and the grapes which are used in the cure both at Vevay and Martreaux are, as at Durkheim, for the most part, the Gutedel and the Austrian varieties.

There is a small Kurgarten at Durkheim, formerly the garden of the castle, where a band plays at the regular hours appointed for the eating of the grapes. On one side, under the trees, there are tables covered with large baskets full of the varieties used in the cure. As at Ems and other places where mineral waters are drank, it is the fashion for every one to buy a glass for himself, so here every one must be provided with a basket to carry the grapes which he purchases from the attendants at the table. The price of the best grapes is at present only two and a half pence per pound. To a stranger the sight is an amusing one, and very different from any thing to be met with elsewhere. Numbers of people are seen walking up and down in the little garden, each with a small black basket full of grapes in his hand, which he is eating with the greatest rapidity, as if he were doing it for a wager. The place is, as may be imagined, covered with grape skins, though some of the burly, round-shouldered Germans bolt skins and all.

The disease in which the grape cure is considered by the German doctors to be most beneficial, is in affections of the mucous membrane of the respiratory organs. The secretive powers of this membrane are roused, and it is enabled to throw off obstructions which have assumed a chronic form. Cases of bronchitis and pneumonia are said to have been often cured, even in patients of scrofulous constitution, and much benefit is said to have been experienced by persons affected with tubercular consumption in its earliest stages. Where spitting of blood has set in, much caution must be used as to the amount of grapes taken. Persons affected with any of these complaints are in the habit of coming to Durkheim yearly from all parts of Germany.

A well-known grape grower in New York some years

ago put forth a theory of curing disease by the use of grapes, but he never carried his theory into practice beyond the circle of his own family. At Durkheim they do it on a large scale.

Trouble in the French Vineyards.—A Paris letter in the London Times says that the extreme heat which prevailed during the vintage in France produced a curious result. The grapes being in general very ripe, fermented in the vats with extraordinary rapidity. A great portion of the saccharine matter had not time to be converted into alcohol, and in countries like Burgundy, where wine-growers do not leave the wine very long in vat, fearing it may become hard and rough, the wine, on account of the saccharine matter remaining in it, will ferment for a long time in the cask. These wines will consequently require much care not only from the danger of excessive fermentation during their transport while young, but even after they are lodged in the consumer's cellar. The excess of saccharine matter will render the wine liable to ferment at every change of weather, and if the cellar is not sufficiently cool the fermentation may produce acidity. There is no doubt that the wines of this year's growth are of excellent quality, but they will require great attention before they arrive at the age of maturity.

The Wine Crop of France.—Of eighty-nine French departments only eleven are not wine growing; of the others, twenty consume all they grow, and fifty-eight export. In France there are upwards of 2,200,000 proprietors of vines. The average annual produce of wine during the four years, 1858–61, was upwards of 38,000,000 hectolitres, which is equivalent to more than 836,000,000 imperial gallons. The wine growers are thirsty souls, for upwards of 15,000,000 hectolitres are set down as consumed by them.

Paris, in 1862, drank 2,696,538 hectolitres of wine, besides about 534,000 hectolitres of spirits, beer, cider and perry. Setting down the population of Paris at 2,000,000, including the floating population of strangers, the allowance per man is handsome, if we consider how little the women and children consume.

French Wines.—France has 6,250,000 acres of vineyards, whose average products, as this year for example, amounts to 1,320,576,000 gallons—multiply by five for bottles. Of this blessed abundance of drink, to be sure, some small rivulets run down foreign throats; but that is a detail. The large estimate of foreign exports is only a little over 3,000,000 hectolitres, or about one-twentieth part of the whole product; distilation into brandy takes up twice as much more; the rest is drunk in France. And with all that, you do know that we have very good authority for the woeful belief that we here in Paris drink one-third at least more wine than ever crossed the *octori* boundary—that is, one bottle is composed of two parts of grape juice and one part Seine water, drugs, deviltry and Mackay mixture generally. There are said to be 5,000,000 of acres of vines in France.

Hock Vineyards of Germany.—A Frankfort-on-the-Main correspondent of the Cincinnati Gazette, writes as follows of the great hock vineyards of that place where the wine known as hock is produced: The hock vineyards do not contain, all told, more than 75 or 80 acres, and in ordinary and good years the product is not more than 600 "stuck" (a stuck is about 1,500 bottles), which gives us a total of 900,000 bottles, yet we are assured by reliable men, engaged in the wine trade, that there are sold every year, at the auctions held at the wine guts, no less than 6,000 stucks, all purporting to be the genuine hock. The

kind of grapes mostly grown in these great wine yards, are the Reissling, Traminer, Gut Edelen, Roland, Orleans, Clevern Fleish, Ostreish.

From the Reisling variety are made those wines so celebrated and well-known throughout the world, such as the Johannisberg, Steinberger, Catinet, Raunthaler, Berg, Leibfraumilch and Marcobeunner. Very good wines also are made from the Traminer. The Fleish is a red grape; the Clevern is reddish purple color, but is more grown in the Palatinate than here. The Gut Edelen and Fleish have very thick skins and are only used as a table grape. (The Reissling never produce in quantity as much juice as any of the other varieties, but it brings a larger price.) The Ostreish seems to be the general favorite for ordinary wines, and from this grape is made most of the sparkling hock and moselle.

For the Johannisberg and other celebrated wines, in consequence of the demand for them, the wine merchants are unable to fill the orders for the trade; so they obtain wines produced in other localities which assimilate to the taste of the respective wines, and label them with these popular names. They are sometimes nearly as good, though an experienced wine merchant will detect the difference at once by the taste, as quickly as he discerns the growth of one year from another.

THE AUTHOR'S CONCLUDING REMARKS

Our little volume is now finished. We have said all we deemed it necessary to say, and given all the facts and opinions of various authorities that we considered essential to elucidate the various points involved, and to correct or confirm our own theories and practical observations and experiences. And although, in so short a space of time as we have had at our disposal, we could not enter as carefully or critically into every department of our subject as we might have done under other circumstances, and as our materials would have justified, yet we think our little Hand-Book will be found to embrace a sufficient amount of condensed knowledge and practical experience on the subject of Grape Culture, expecially in California, to enable any sensible judicious man to go on with the culture of the grape understandingly and with success. That it will be found to be *perfect*, in all its part and proportions, we can scarcely allow ourself to hope. We have not sought so much to advance or inculcate any particular theories of our own, as to give the opinions and practical suggestions of those who have had a large experience in California grape culture, and who are men of intelligence and liberal minds, and whose experiences and opinions we deem entitled to great weight, at the same time reserving to our own judgment,

and conceding to the reader the right and privilege of approving and adopting, only such theories and ideas and practical experiments as to us or him may seem most sensible and proper.

The great magnitude which the vinicultural interest of California, as well as of the United States generally, is beginning to assume, and is destined to reach, especially in California, where we see no reason to doubt its complete success, makes it a pleasure to us to give the weight of our influence and our best exertions to aid in its advancement. Say what we may of the rich mineral resources of California, and they do, indeed, seem inexhaustible, we confidently believe and predict that long ere the close of this century, the grape growing and wine making interests of California will far outstrip every other.

And now, as this little volume must necessarily go to press far from the supervising or revising oversight of the Author, who has always been accustomed to supervise his own proof-sheets, he trusts that any typographical inaccuracies or oversights that may, perchance, occur, will not be laid to his account.

And, trusting to the generosity of a liberal and enlightened public to overlook all deficiencies of whatever nature that may be found, the Author begs to present to his friends and the public, his heartiest salutation, wishing them all the congratulations and COMPLIMENTS OF THE SEASON.

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